# Thecus N7700

User's Manual

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# About This Manual

All information in this manual has been carefully verified to ensure its correctness. In case of an error, please provide us with your feedback. Thecus Technology Corporation reserves the right to modify the contents of this manual without notice.

Product name: Thecus N7700
Manual Version: 1.04
Release Date: July 2009

# Limited Warranty

Thecus Technology Corporation guarantees all components of Thecus N7700 are thoroughly tested before they leave the factory and should function normally under general usage. In case of any system malfunctions, Thecus Technology Corporation and its local representatives and dealers are responsible for repair without cost to the customer if the product fails within the warranty period and under normal usage. Thecus Technology Corporation is not responsible for any damage or loss of data deemed to be caused by its products. It is highly recommended that users conduct necessary back-up practices.

# Safety Warnings

For your safety, please read and follow the following safety warnings:

- Read this manual thoroughly before attempting to set up your N7700.
- Your N7700 is a complicated electronic device. DO NOT attempt to repair it under any circumstances. In the case of malfunction, turn off the power immediately and have it repaired at a qualified service center. Contact your vendor for details.
- DO NOT allow anything to rest on the power cord and DO NOT place the power cord in an area where it can be stepped on. Carefully place connecting cables to avoid stepping or tripping on them.
- Your N7700 can operate normally under temperatures between 0°C and 40°C, with relative humidity of 20% – 85%. Using the N7700 under extreme environmental conditions could damage the unit.
- Ensure that the N7700 is provided with the correct supply voltage (AC 100V ~ 240V, 50/60 Hz, 3A). Plugging the N7700 to an incorrect power source could damage the unit.
- Do NOT expose the N7700 to dampness, dust, or corrosive liquids.
- Do NOT place the N7700 on any uneven surfaces.
- DO NOT place the N7700 in direct sunlight or expose it to other heat sources.
- DO NOT use chemicals or aerosols to clean the N7700. Unplug the power cord and all connected cables before cleaning.
- DO NOT place any objects on the N7700 or obstruct its ventilation slots to avoid overheating the unit.
- Keep packaging out of the reach of children.
- If disposing of the device, please follow your local regulations for the safe disposal of electronic products to protect the environment.

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# Chapter 1: Introduction

## *Overview*

Thank you for choosing the Thecus N7700 IP Storage Server. The Thecus N7700 is an easy-to-use storage server that allows a dedicated approach to storing and distributing data on a network. Data reliability is ensured with RAID features that provide data security and recovery—over one Terabyte of storage is available using RAID 5 and RAID 6. Gigabit Ethernet ports enhance network efficiency, allowing the N7700 to take over file management functions, increase application and data sharing and provide faster data response. The N7700 offers data mobility with a disk roaming feature that lets you hot swap working hard drives for use in another N7700, securing the continuity of data in the event of hardware failure. The N7700 allows data consolidation and sharing between Windows (SMB/CIFS), UNIX/Linux, and Apple OS X environments. The N7700's user-friendly GUI supports multiple languages.

## *Product Highlights*

### File Server

First and foremost, the N7700 allows you to store and share files over an IP network. With a Network Attached Storage (NAS) device, you can centralize your files and share them easily over your network. With the easy-to-use web-based interface, users on your network can access these files in a snap.

To learn about the Web User Interface, go to **Chapter 6: Using the N7700 > Using WebDisk**.

### FTP Server

With the built-in FTP Server, friends, clients, and customers can upload and download files to your N7700 over the Internet with their favorite FTP programs. You can create user accounts so that only authorized users have access.

To set up the FTP Server, refer to **Chapter 5: Additional Feature Setup > FTP Server**.

### Backup Server

Don't leave precious data to chance. With advanced backup capabilities, you can easily upload mission critical files to the N7700, and even automate your backup tasks for true peace-of-mind.

To find out how to backup your files with the N7700, refer to **Chapter 6: Using the N7700 > File Backup**.

### Printer Server

With the N7700's Printer Server, you can easily share an IPP printer with other PCs connected to your network.

To set up the Printer Server, refer to **Chapter 5: Additional Feature Setup > Printer Server**.

### Multiple RAID

N7700 supports multiple RAID volumes on one system. So, you can create RAID 0 for your non-critical data, and create RAID 5 for mission-critical data. Create the RAID levels depending on your needs.

To configure RAID modes on the N7700, refer to **Chapter 4: System Management > Storage Management > RAID List**.

### Dual Mode Support

N7700 is not only a file server, but it also supports iSCSI initiators. Your server can access N7700 as a direct-attached-storage over the LAN or Internet. There is no easier way to expand the capacity of your current application servers. All the storage needs can be centrally managed and deployed. This brings ultimate flexibility to users.

To set up an iSCSI volume, refer to **Chapter 4: System Management > Storage Management > Space Allocation > Allocating Space for iSCSI Volume**.

### Superior Power Management

N7700 supports schedule power on/off. With this feature, administrator can set at what time to turn on or off the system. This feature is a big plus for people who want to conserve energy. Wake-On-LAN enables administrator to remotely turn on the system without even leaving their own seat.

To schedule system on and off, refer to **Chapter 4: System Management > System Settings > Reboot and Shutdown System > Scheduled Power On/Off**.

## *Package Contents*

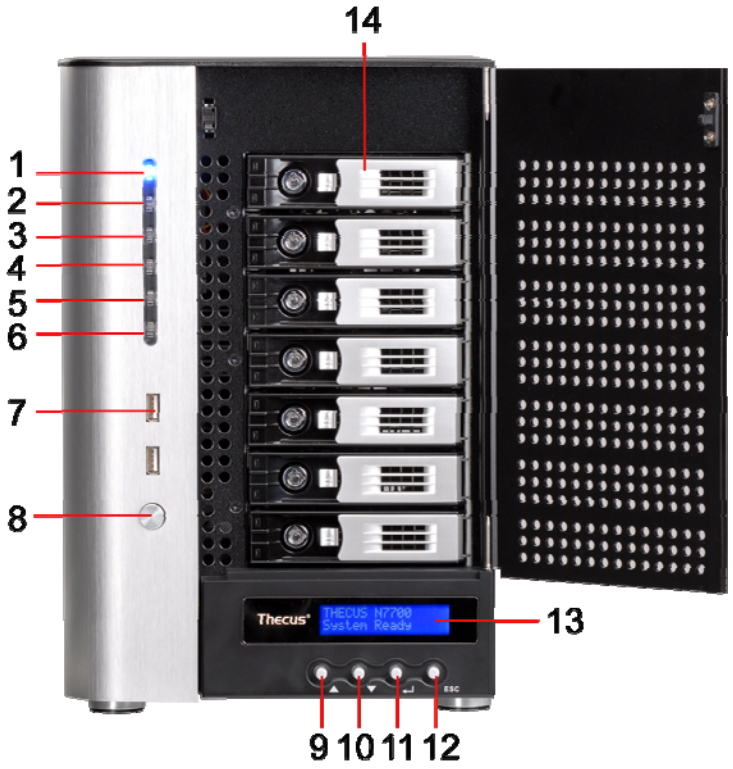
Your N7700 package should contain the following items:

- QIG
- CD-Title
- Ethernet Cable
- Screw Kit

Please check to see if your package is complete. If you find that some items are missing, contact your dealer.

## *Front Panel*

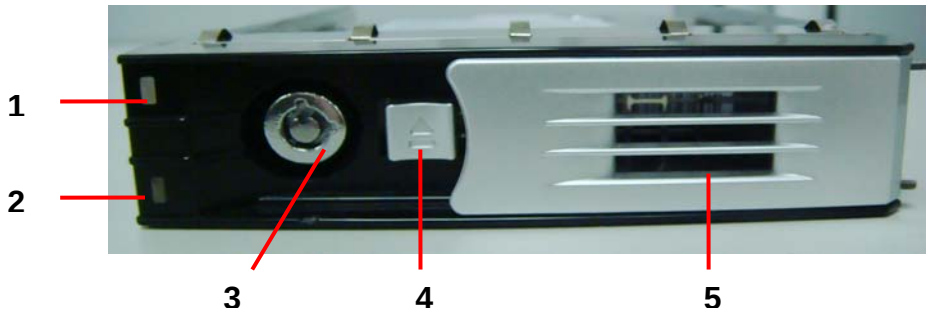
The Thecus N7700's front panel has the device's controls, indicators, and hard disk trays:




| Front Panel | |
|---|---|
| **Item** | **Description** |
| 1.Power LED | • **Solid blue:** System is power on. |
| 2.System LED | • **Solid orange:** system is being upgraded or system startup; data currently inaccessible |
| 3.WAN LED | • **Solid green:** network link<br>• **Blinking green:** network activity |
| 4.LAN LED | • **Solid green:** network link<br>• **Blinking green:** network activity |
| 5.USB Copy LED | • **Solid blue:** files are being copied from a USB storage device |
| 6.eSATA link LED | • **Solid blue:** external eSATA device has connected |
| 7.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, USB printers, and USB wireless dongles*<br><br>**Note**: For supported USB wireless dongles, please contact http://esupport.thecus.com/support |
| 8.Power Button | • Power on/off N7700 |
| 9.Up Button ▲ | • Push to scroll up when using the LCD display |
| 10.Down Button ▼ | • Push to enter USB copy operation screen |
| 11.Enter Button ↵ | • Push to enter LCD operate password for basic system setting |
| 12.Escape Button **ESC** | • Push to leave the current LCD menu |
| 13.LCD Display | • Displays current system status and warning messages |
| 14.HDD Trays | • Seven 3.5" HDD trays<br>• Locks are provided for added security |

## *Hard Disk Trays*

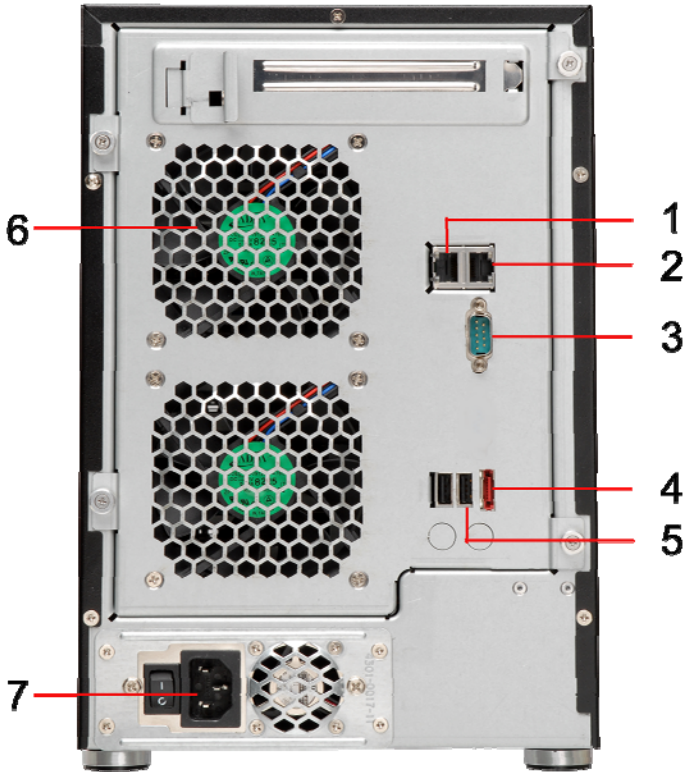
Each of the N7700's hard disk trays has a lock, a latch, and two LED indicators:




| Hard Disk Trays | |
|---|---|
| **Item** | **Description** |
| 1.HDD Power LED | • **Solid blue:** hard disk is powered on |
| 2.HDD Access/Error LED | • **Blinking green:** system is accessing data on the hard disk |
| 3.Lock | • Use the lock to physically secure the hard disk to the unit |
| 4.Latch | • Use to open and remove or close and secure the tray |
| 5.Handle | • Pull out HDD tray |

## *Rear Panel*

The N7700 rear panel features ports and connectors.



| Back Panel | |
|---|---|
| **Item** | **Description** |
| 1.LAN Port | • LAN port for connecting to an Ethernet network through a switch or router |
| 2.WAN Port | • WAN port for connecting to an Ethernet network through a switch or router |
| 3.Serial Port | • This port is for external UPS device |
| 4.eSATA Port | • eSATA port for high-speed storage expansion |
| 5.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 6.System Fan | • System fan that exhausts heat from the unit |
| 7.Power Connector | • Connect the included power cords to these connectors |

# Chapter 2: Hardware Installation

## *Overview*

Your N7700 is designed for easy installation. To help you get started, the following chapter will help you quickly get your N7700 up and running. Please read it carefully to prevent damaging your unit during installation.

## *Before You Begin*

Before you begin, be sure to take the following precautions:

1. Read and understand the ***Safety Warnings*** outlined in the beginning of the manual.

2. If possible, wear an anti-static wrist strap during installation to prevent static discharge from damaging the sensitive electronic components on the N7700.

3. Be careful not to use magnetized screwdrivers around the N7700's electronic components.

## *Hard Disk Installation*

The N7700 supports seven standard 3.5" SATA or SAS (N7700SAS only) hard disks. To install a hard disk into the N7700, follow the steps below:

1. Remove a hard disk tray from the N7700.

2. Slide the new SATA or SAS (N7700SAS only) hard disk into the tray and fasten the screws.

3. Insert the hard disk and tray back into the N7700 until it snaps into place and lock it with a key if desired.

4. The LED blinks green when the hard disk is accessed.

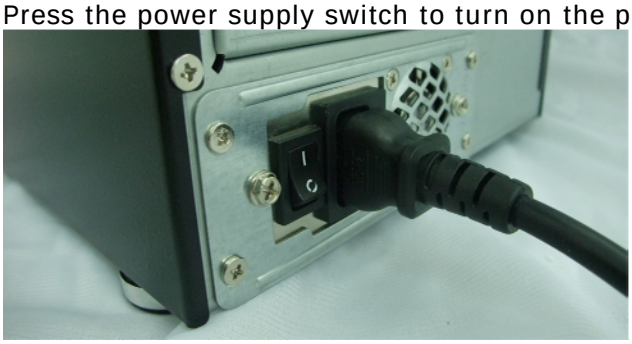
**NOTE** If your HDD was part of a RAID 1 or RAID 5 array previously, it automatically rebuilds. If you replace all the drives with higher capacity drives, you will need to go to Administrator login and format the drives.

## *Cable Connections*

To connect the N7700 to your network, follow the steps below:

1. Connect an Ethernet cable from your network to the WAN port on the back panel of the N7700.

2. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket. Press the power supply switch to turn on the power supply.



3. Press the power button on the Front Panel to boot up the N7700.

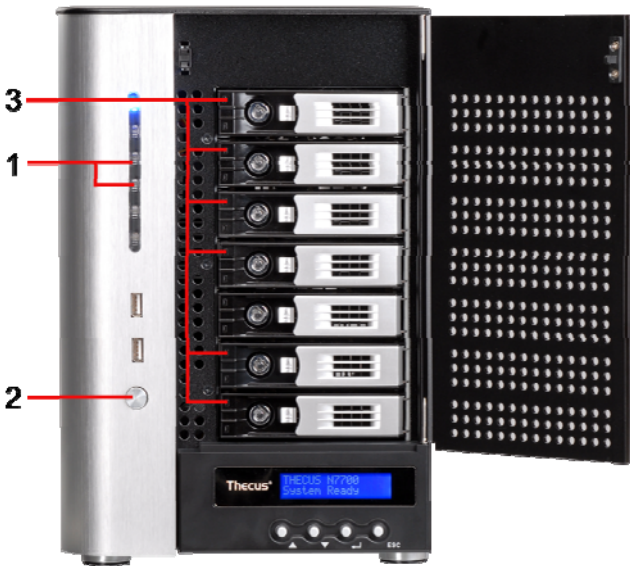
## *Checking System Status*

After making connections on the N7700 and powering up, check whether the system status is normal or has trouble by observing indicators on the front panel and hard disk trays.

### System Status Normal

The system status is normal if:

1. The WAN and LAN LEDs glow green (assuming both are connected).
2. The Power LED on the Front Panel glows blue.
3. The HDD Power LED on each HDD tray glows blue (assuming all disks are installed).
4. The default IP address of the WAN port is 192.168.1.100 displayed on LCD.




### System Trouble

The system has trouble if:

1. System Busy LED glows red.

If the system has trouble, please refer to **Chapter 8: Troubleshooting**.

**WARNING** There are no user serviceable parts inside the N7700. Please contact your distributor for service.

# Chapter 3: First Time Setup

## *Overview*

Once the hardware is installed, physically connected to your network, and powered on, you can configure the N7700 so that it is accessible to your network users. There are two ways to set up your N7700: using the **Thecus Setup Wizard** or the **LCD display**. Follow the steps below for initial software setup.

## *Thecus Setup Wizard*

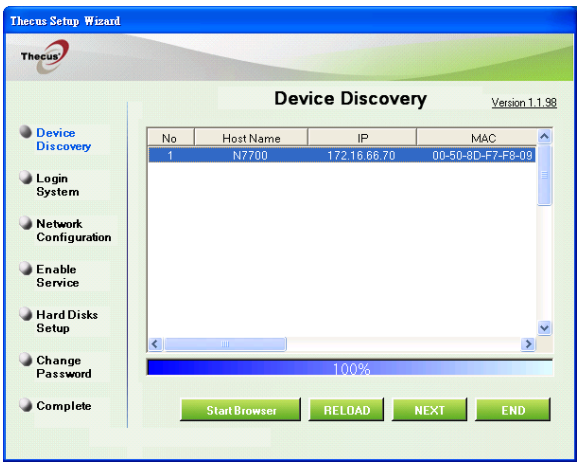
The handy Thecus Setup Wizard makes configuring N7700 a snap. To configure the N7700 using the Setup Wizard, perform the following steps:

1. Insert the installation CD into your CD-ROM drive (the host PC must be connected to the network).

2. The Setup Wizard should launch automatically. If not, please browse your CD-ROM drive and double click on **Setup.exe.**

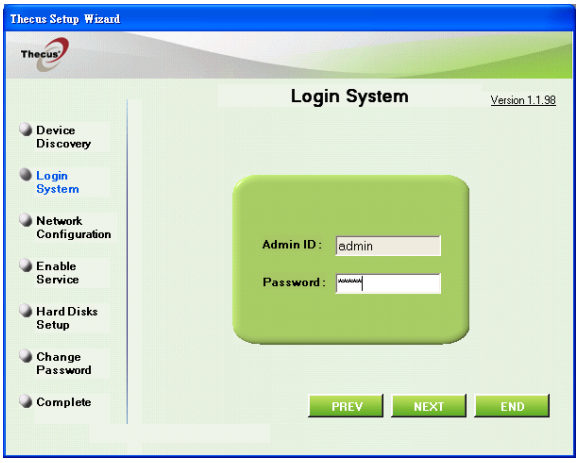
**NOTE** For MAC OS X users, double click on Thecus Setup Wizard 1.1.99.dmg

3. The Setup Wizard will start and automatically detect all Thecus storage devices on your network. If none are found, please check your connection and refer to **Chapter 8: Troubleshooting** for assistance.

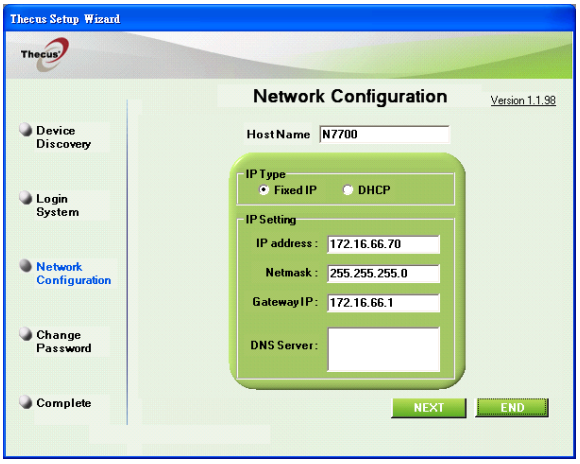



4. Select the N7700 that you like to configure.

5. Login with the administrator account and password. The default account and password are both “admin”.

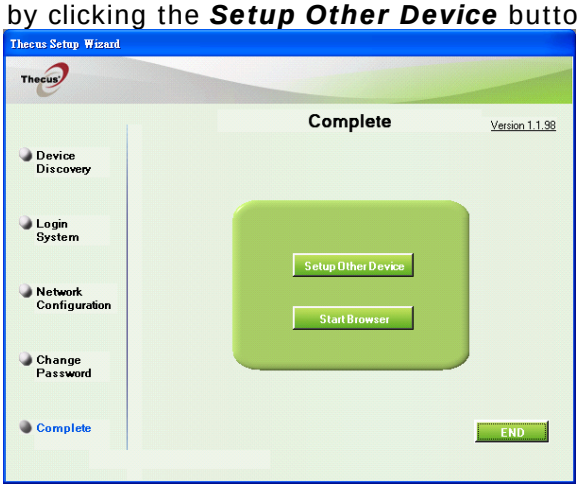



6. Name your N7700 and configure the network IP address. If your switch or router is configured as a DHCP Server, configuring the N7700 to automatically obtain an IP address is recommended. You may also use a static IP address and enter the DNS Server address manually.




7. Change the default administrator password.

8. Finished! Access the N7700 Web Administrator Interface by pressing the ***Start Browser*** button. You can also configure another N7700 at this point by clicking the ***Setup Other Device*** button. Press ***Exit*** to exit the wizard.




**NOTE**

The Thecus Setup Wizard is designed for installation on systems running Windows XP/2000 or Mac OSX or later. Users with other operating systems will need to install the Thecus Setup Wizard on a host machine with one of these operating systems before using the unit.

## *LCD Operation*

The N7700 is equipped with an LCD on the front for easy status display and setup. There are four buttons on the front panel to control the LCD functions.

### LCD Controls

Use the **Up** (▲), **Down** (▼), **Enter** (↵) and **Escape** (**ESC**) keys to select various configuration settings and menu options for N7700 configuration.

The following table illustrates the keys on the front control panel:

| LCD Controls | | |
|---|---|---|
| **Icon** | **Function** | **Description** |
| ▲ | Up Button | Select the previous configuration settings option. |
| ▼ | Down Button | USB copy confirmation display. |
| ↵ | Enter | Enter the selected menu option, sub-menu, or parameter setting. |
| **ESC** | Escape | Escape and return to the previous menu. |

There are two modes of operation for the LCD: **Display Mode** and **Management Mode**.

### Display Mode

During normal operation, the LCD will be in **Display Mode**.

| Display Mode | |
|---|---|
| **Item** | **Description** |
| Host Name | Current host name of the system. |
| WAN | Current WAN IP setting. |
| LAN | Current LAN IP setting. |
| Link Aggregation | Current Link Aggregation status |
| System Fan1 | Current system fan 1 status. |

| | |
|---|---|
| System Fan2 | Current system fan 2 status. |
| CPU Fan | Current CPU fan status |
| 2006/06/16 12:00 | Current system time. |
| Disk Info | Current status of disk slot has been installedh |
| RAID | Current RAID status. |

The N7700 will rotate these messages every one-two seconds on the LCD display.

### *USB Copy*

The USB Copy function enables you to copy files stored on USB devices such as USB disks and digital cameras to the N7700 with a press of a button. To use USB copy, follow the steps below:

1. Plug your USB device into an available USB port on the Front Panel.
2. In **Display Mode**, press the **Down Button** (▼).
3. The LCD will display "**USB Copy?**"
4. Press **Enter** (↵) and the N7700 will start copying USB disks connected to the front USB port.
5. All of data will be copied into system folder named "USBcopy".

### Management Mode

During setup and configuration, the LCD will be in **Management Mode**.

To enter into Management Mode, press **Enter (↵)** and an "*Enter Password*" prompt will show on the LCD.

At this time, the administrator has to enter the correct LCD password. System will check whether the correct LCD password has been entered. The default LCD password is "0000". If correct password is entered, you will enter into the **Management Mode** menu.

| **Management Mode** | |
|---|---|
| **Item** | **Description** |
| WAN Setting | IP address and netmask of your WAN ports. |
| LAN Setting | IP address and netmask of your LAN ports. |
| Link Agg. Setting | Select **Load Balance** or **Failover**. |
| Change Admin Passwd | Change administrator's password for LCD operation. |
| Reset to Default | Reset system to factory defaults. |
| Exit | Exit **Management Mode** and return to **Display Mode**. |

**NOTE**

You can also change your LCD password using the Web Administration Interface by navigating to **System** > **Administrator Password**. For more on the Web Administration Interface, see **Chapter 4: System Management**.

## *Typical Setup Procedure*

From the Web Administration Interface, you can begin to setup your N7700 for use on your network. Setting up the N7700 typically follows the five steps outlined below.

For more on how to use the Web Administration Interface, see **Chapter 4: System Management > Web Administration Interface**.

### Step 1: Network Setup

From the Web Administration Interface, you can configure the network settings of the N7700 for your network. You can access the **Network** menu from the menu bar.
For details on how to configure your network settings, refer to **Chapter 4: System Management > Network Management**.

### Step 2: RAID Creation

Next, administrators can configure their preferred RAID setting and build their RAID volume. You can access RAID settings from the menu bar of the Web Administration Interface by navigating to ***Storage > RAID.***

For more information on configuring RAID, see **Chapter 4: System Management > RAID Configuration**.

Don't know which RAID level to use? Find out more about the different RAID levels from **Appendix C: RAID Basics**.

### Step 3: Create Local Users or Setup Authentication

Once the RAID is ready, you can begin to create local users for the N7700, or choose to setup authentication protocols such as Active Directory (AD).

For more on managing users, go to **Chapter 4: System Management > User and Group Management**.

For more information on configuring Active Directory, see **Chapter 4: System Management > User and Group Management > ADS/NT Configuration**.

For information about the benefits of Active Directory, see **Appendix D: Active Directory Basics**.

### Step 4: Create Folders and Set Up ACLs

Once users are introduced into your network, you can begin to create various folders on the N7700 and control user access to each using Folder Access Control Lists.

More information on managing folders, see **Chapter 4: System Management > Folder Management**.

To find out about configuring Folder Access Control Lists, see **Chapter 4: System Management > Folder Management > Folder Access Control List (ACL)**.

### Step 5: Start Services

Finally, you can start to setup the different services of the N7700 for the users on your network. You can find out more about each of these services by clicking below:

**SMB/CIFS**

**Apple File Protocol (AFP)**

**Network File System (NFS)**

**File Transfer Protocol (FTP)**

**iTunes Server**

**Media Server**

**Printer Server**

**Download Manager**

**Photo Server**

# Chapter 4: System Management

## *Overview*

The N7700 provides an easily accessible **Web Administration Interface**. With it, you can configure and monitor the N7700 anywhere on the network.

## *Web Administration Interface*

Make sure your network is connected to the Internet. To access the N7700 **Web Administration Interface**:

1. Type the N7700's IP address into your browser. (Default IP address is `http://192.168.1.100`)

**NOTE** Your computer's network IP address must be on the same subnet as the N7700. If the N7700 has default IP address of 192.168.1.100, your managing PC IP address must be 192.168.1.x, where x is a number between 1 and 254, but not *100*.

2. Login to the system using the administrator user name and password. The factory defaults are:

   User Name: `admin`
   Password: `admin`

   If you changed your password in the setup wizard, use the new password.

Once you are logged in as an administrator, you will see the **Web Administration Interface**. From here, you can configure and monitor virtually every aspect of the N7700 from anywhere on the network.

### Menu Bar

The **Menu Bar** is where you will find all of the information screens and system settings of the N7700. The various settings are placed in the following groups on the menu bar:

| **Menu Bar** | |
|---|---|
| **Item** | **Description** |
| Status | Current system status of the N7700. |
| Storage | Information and settings for storage devices installed into the N7700. |

| | |
|---|---|
| Network | Information and settings for network connections, as well as various services of the N7700. |
| Accounts | Allows configuration of users and groups. |
| System | Various N7700 system settings and information. |
| Language | Choose your preferred language here. |

Moving your cursor over any of these items will display the dropdown menu selections for each group.

In the following sections, you will find detailed explanations of each function, and how to configure your N7700.

## *Language Selection*

The N7700 supports multiple languages, including:

- English
- French
- German
- Italian
- Traditional Chinese
- Simplified Chinese
- Japanese
- Korean
- Spanish

On the menu bar, click ***Language*** and the **Change Language** screen appears. This screen allows you to select preferred language for the N7700. Press ***Apply*** to confirm your selection.

## *Status Menu*

The **Status** Menu on the menu bar allows you to see various aspects of the N7700. From here, you can discover the status of the N7700, and even find out other details like firmware version and up time.

### Product Information

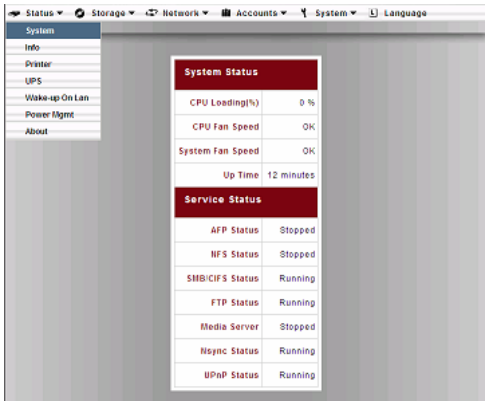
Once you login, you will first see the basic **Product Information** screen providing **Manufacturer**, **Product No.**, **Firmware Version**, and **Up Time** information.

| Product Information | |
|---|---|
| **Item** | **Description** |
| Manufacturer | Displays the name of the system manufacturer. |
| Product No. | Shows the model number of the system. |
| Firmware version | Shows the current firmware version. |
| Up time | Displays the total run time of the system. |

To access this screen again, navigate to ***Status*** > ***About***.

## System/Service Status

From the **Status** menu, choose the ***System*** item, and the **System Status** and **Service Status** screens appear. These screens provide basic system and service status information.




| System Status | |
|---|---|
| **Item** | **Description** |
| CPU Loading (%) | Displays current CPU workload of the N7700. |
| CPU Fan Speed | Displays current CPU fan status. |
| System Fan1 Speed | Displays the current status of the system fan 1. |
| System Fan2 Speed | Displays the current status of the system fan 2. |
| Up Time | Shows how long the system has been running. |

| Service Status | |
|---|---|
| **Item** | **Description** |
| AFP Status | The status of the Apple Filing Protocol server. |
| NFS Status | The status of the Network File Service Server. |
| SMB/CIFS Status | The status of the SMB/CIFS server. |
| FTP Status | The status of the FTP server. |
| Media Server | The status of the Media Server |
| Nsync Status | The status of the Nsync server. |
| UPnP Status | The status of the UPnP service. |
| SNMP | The status of the SNMP service. |

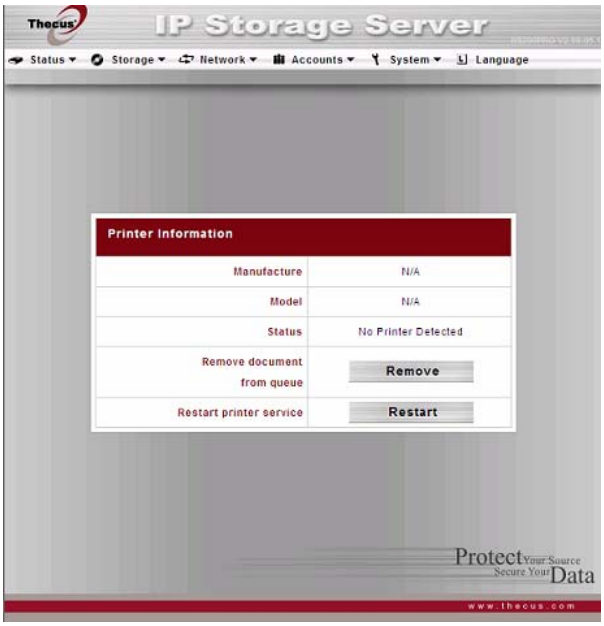
## System Information

From **Status** menu, choose the ***Info*** item, and the **System Information** screen appears. You can change the system information that appears on the Login page by entering the new information here and pressing ***Apply*** to confirm.

| System Information | |
|---|---|
| **Item** | **Description** |
| System Description | Shows the system description that would also appear on the Login page. |

## Printer Status

From the **Status** menu, choose the ***Printer*** item, and the **Printer Information** screen appears. This screen provides the following information about the USB printer connected to the USB port.




| Printer Status | |
|---|---|
| **Item** | **Description** |
| Manufacturer | Displays the name of the USB printer manufacturer. |
| Model | Displays the model of the USB printer. |
| Status | Displays the status of the USB printer. |
| Remove document from Queue | Click to remove all documents from printer queue |
| Restart Printer service | Click to restart printer service |

If a corrupt print job is sent to a printer, printing may suddenly fail. If your print jobs seem to be locked up, pressing the ***Remove All Documents*** button to clear the print queue may resolve the issue.

For information on how to set up the Printer Server, refer to **Chapter 5: Additional Feature Setup > Printer Server**.

## UPS Settings

The N7700 can also support various uninterruptible power supply units, providing extra data security and accessibility in the case of a power failure.

From the **Status** menu, choose the ***UPS*** item and the **UPS Setting** screen appears. Make any changes you wish, and press ***Apply*** to confirm changes. See the following table for a detailed description of each item.

| UPS Settings | |
|---|---|
| **Item** | **Description** |
| UPS Monitoring | Enable or disable UPS monitoring. |
| Manufacturer | Choose the UPS manufacturer and model number from the dropdowns. |
| Battery Status | Current status of the UPS battery |
| Power | Current status of the power being supplied to the UPS |
| Seconds between power failure and first notification | Delay between power failure and first notification in seconds. |
| Seconds between subsequent power failure notifications | Delay between subsequent notifications in seconds. |
| Shutdown the system when the battery charge is less than | Amount of UPS battery remaining before system should auto-shutdown. |
| Apply | Press ***Apply*** to save your changes. |

For a list of supported UPS units, see **Appendix E: UPS Compatibility List**.

## Wake-Up On Lan (WOL)

The N7700 has the ability to be awoken from sleep mode via WAN port.

From the **Status** menu, choose the ***WOL*** item, and the **Wake-up On Lan Configuration** screen appears. From here, you can **Enable** or **Disable**.

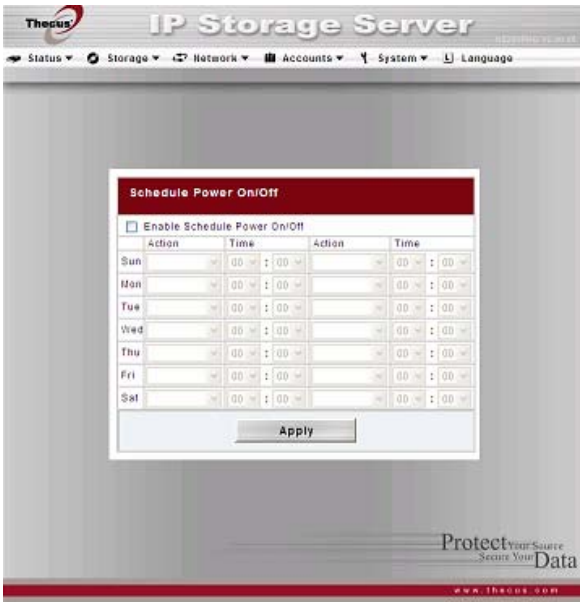
| Wake-up On Lan Configuration | |
|---|---|
| **Item** | **Description** |
| WOL Servic | **Enable** or **Disable** WOL service |
| Apply | Click ***Apply*** to save changes. |

## Power Management

Using the N7700's Power Management, you can save energy and money by scheduling the N7700 to turn itself on and off during certain times of the day.

From the **Status** menu, choose the ***Power Mgmt*** item and the **Schedule Power On/Off** screen appears.

To designate a schedule for the N7700 to turn on and off, first enable the feature by checking the **Enable Schedule Power On/Off** checkbox.




Then, simply choose an on and off time for each day of the week that you would like to designate a schedule by using the various dropdowns.

Finally, click ***Apply*** to save your changes.

**Example - Monday: On: 8:00; Off: 16:00**
System will turn on at 8:00 AM on Monday, and off at 16:00 on Monday. System will turn on for the rest of the week.

If you choose an on time, but do not assign an off time, the system will turn on and remain on until a scheduled off time is reached, or if the unit is shutdown manually.

**Example - Monday: On: 8:00**
System will turn on at 8:00 AM on Monday, and will not shut down unless powered down manually.

You may also choose two on times or two off times on a particular day, and the system will act accordingly.

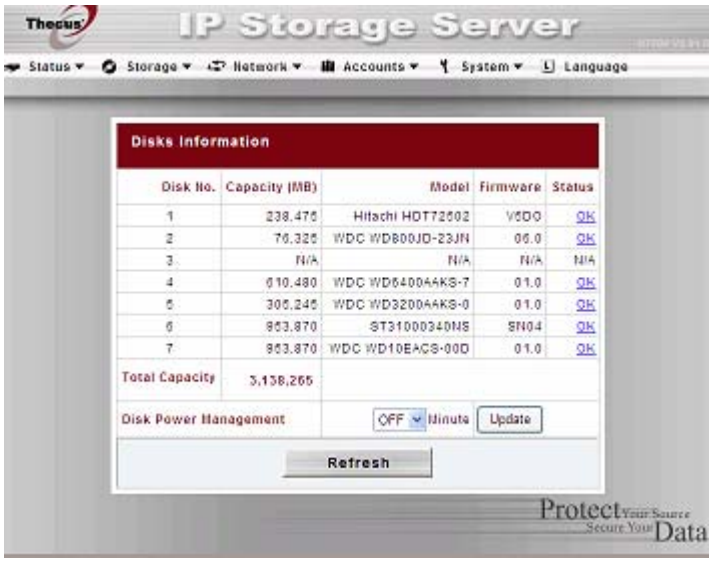
**Example - Monday: Off: 8:00; Off: 16:00**
System will turn off at 8:00 AM on Monday. System will turn off at 16:00 PM on Monday, if it was on. If the system was already off at 16:00 PM on Monday, system will stay off.

## *Storage Management*

The **Storage Menu** displays the status of storage devices installed in the N7700, and includes storage configuration options such as RAID and disk settings, folder configuration, and Nsync settings.

### Disks Information

From the **Storage** menu, choose the ***Disks*** item and the **Disks Information** screen appears. From here, you can see various items about installed SATA or SAS hard disks. Blank lines indicate that a SATA\SAS (N7700SAS only) hard disk is not currently installed in that particular disk slot.



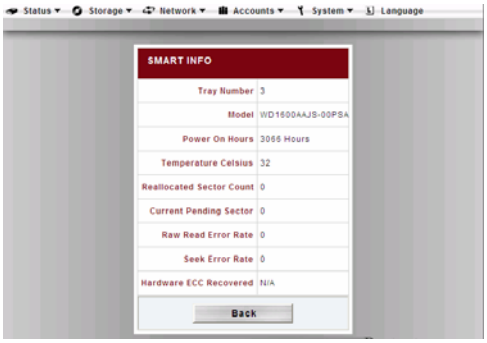

| Disks Information | |
|---|---|
| **Item** | **Description** |
| Disk No. | Indicates disk location. |
| Capacity | Shows the hard disk capacity. |
| Model | Displays the hard disk model name. |
| Firmware | Shows the hard disk firmware version. |
| Status | Indicates the status of the disk. Can read **OK**, **Warning**, or **Failed**. |
| Total Capacity | Shows the total hard disk capacity. |
| Disk Power Management | The administrator can set the disk to power down after a period of inactivity. |

**NOTE**

When the Status shows Warning, it usually means there are bad sectors on the hard disk. It is shown only as a precaution and you should consider changing the drives.

### *S.M.A.R.T. Information*

On the **Disks Information** screen, the status of each disk will be displayed in the **Status** column. Clicking on an ***OK*** or ***Warning*** link will display the **S.M.A.R.T Information** window for that particular disk.




| S.M.A.R.T. Information | |
|---|---|
| **Item** | **Description** |
| Tray Number | Tray the hard disk is installed in. |
| Model | Model name of the installed hard disk. |
| Power ON Hours | Count of hours in power-on state. The raw value of this attribute shows total count of hours (or minutes, or seconds, depending on manufacturer) in power-on state. |
| Temperature Celsius | The current temperature of the hard disk in degrees Celsius |
| Reallocated Sector Count | Count of reallocated sectors. When the hard drive finds a read/write/verification error, it marks this sector as "reallocated" and transfers data to a special reserved area (spare area). This process is also known as remapping and "reallocated" sectors are called remaps. This is why, on a modern hard disks, you can not see "bad blocks" while testing the surface - all bad blocks are hidden in reallocated sectors. However, the more sectors that are reallocated, the more a decrease (up to 10% or more) can be noticed in disk read/write speeds. |
| Current Pending Sector | Current count of unstable sectors (waiting for remapping). The raw value of this attribute indicates the total number of sectors waiting for remapping. Later, when some of these sectors are read successfully, the value is decreased. If errors still occur when reading sectors, the hard drive will try to restore the data, transfer it to the reserved disk area (spare area), and mark this sector as remapped. If this attribute value remains at zero, it indicates that the quality of the corresponding surface area is low. |
| Back | Press ***Back*** to go back to the **Disks Information** screen. |

**NOTE**

If the Reallocated Sector Count or Current Pending Sector of a hard disk drive is not zero, the status of the disk will show “Warning”. This warning is only used to alert the system administrator that there are bad sectors on the disk, and they should replace those disks as soon as possible.

## RAID Information

From the **Storage** menu, choose the ***RAID*** item and the **RAID List** screen appears.

This screen lists the RAID volumes currently residing on the N7700. From this screen, you can get information about the status of your RAID volumes, as well as the capacities allocated for data and iSCSI. There is also a graph which represents how the RAID volume is currently allocated.

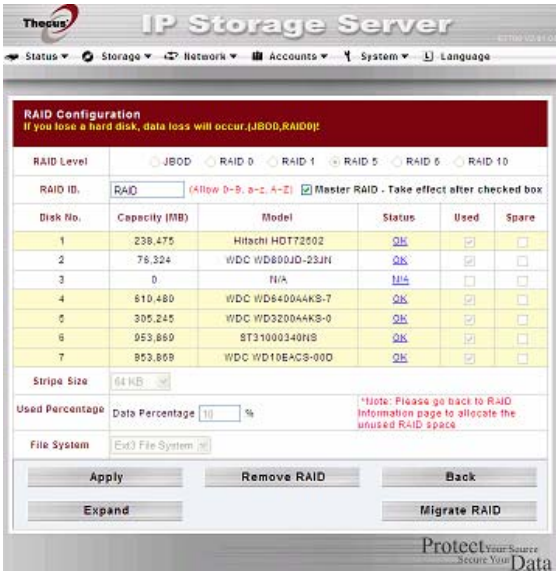
To configure your RAID settings, press the ***RAID Config*** button to go to the **RAID Configuration** screen.

| RAID Information | |
|---|---|
| **Item** | **Description** |
| Select | Used to select the current RAID volume. |
| Master RAID | The RAID volume currently designated as the Master RAID volume. |
| ID | ID of the current RAID volume.<br>**NOTE: All RAID IDs must be unique.** |
| RAID Level | Shows the current RAID configuration. |
| Status | Indicates status of the RAID. Can read either ***Healthy***, ***Degraded***, or ***Damaged***. |
| Disks Used | Hard disks used to form the current RAID volume. |
| Total Capacity | Total capacity of the current RAID. |
| Data Capacity | Indicates the used capacity and total capacity used by user data. |
| iSCSI Capacity | Indicates the capacity allocated to iSCSI. |
| RAID Config | Press this to configure RAID volumes. |
| Space Allocation | Press this to adjust the space allocated for data and iSCSI. |

## RAID Configuration

On the **RAID List** screen, press the ***RAID Config*** button to go to the **RAID Configuration** screen. In addition to RAID disk information and status, this screen lets you make RAID configuration settings.

For more information on RAID, see **Appendix C: RAID Basics**.




### *RAID Level*

You can set the storage volume as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5, RAID 6 or RAID 10**. RAID configuration is usually required only when you first set up the device. A brief description of each RAID setting follows:

| RAID Levels | |
|---|---|
| **Level** | **Description** |
| JBOD | The storage volume is a single HDD with no RAID support. JBOD requires a minimum of 1 disk. |
| RAID 0 | Provides data striping but no redundancy. Improves performance but not data safety. RAID 0 requires a minimum of 2 disks. |
| RAID 1 | Offers disk mirroring. Provides twice the read rate of single disks, but same write rate. RAID 1 requires a minimum of 2 disks. |
| RAID 5 | Data striping and stripe error correction information provided. RAID 5 requires a minimum of 3 disks. RAID 5 can sustain one failed disk. |
| RAID 6 | Two independent parity computations must be used in order to provide protection against double disk failure. Two different algorithms are employed to achieve this purpose. RAID 6 requires a minimum of 4 disks. RAID 6 can sustain two failed disks. |
| RAID 10 | RAID 10 has high reliability and high performance. RAID 10 is |

| | |
|---|---|
| | implemented as a striped array whose segments are RAID 1 arrays. It has the fault tolerance of RAID 1 and the performance of RAID 0. RAID 10 requires 4 disks. RAID 10 can sustain two failed disks. |

**WARNING** If the administrator improperly removes a hard disk that should not be removed when RAID status is Degraded, all data will be lost.

### *RAID Configuration*

Using **RAID Settings**, you can select stripe size, choose which disks are RAID disks or the Spare Disk. .

| RAID Configurations | |
|---|---|
| **Item** | **Description** |
| RAID | Check the boxes of the hard drives you wish to add to the storage volume. |
| Master RAID | Check a box to designate this as the Master RAID volume. See the **NOTE** below for more information. |
| Disk No. | Number assigned to the installed hard disks. |
| Capacity (MB) | Capacity of the installed hard disks. |
| Model | Model number of the installed hard disks. |
| Status | Status of the installed hard disks. |
| Member | If this is checked, current hard disk is a part of a RAID volume. |
| Spare | If this is checked, current hard disk is designated as a spare for a RAID volume. |
| Stripe Size | This sets the stripe size to maximize performance of sequential files in a storage volume. Keep the 64K setting unless you require a special file storage layout in the storage volume. A larger stripe size is better for large files. |
| Used Percentage | The percentage of the RAID volume that will be used to store data. |
| Apply | Press this button to configure a file system and create the RAID storage volume. |
| Remove | Click to remove the RAID volume. All user data, and iSCSI data will be removed. |
| Back | Press this button to exit without saving changes. |
| Expand | Press this button to configure a file system and create the RAID storage volume. |
| Migration | Press this button to migrate RAID level. |

### *Creating a RAID*

To create a RAID volume, follow the steps below:

1. On the **RAID Information** screen, click ***New***.
2. On the **RAID Configuration** screen, set the RAID storage space as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5**, **RAID 6**, or **RAID 10** — see **Appendix C: RAID Basics** for a detailed description of each.
3. Specify a RAID ID.
4. If this RAID volume is meant to be the Master RAID volume, tick the **Master RAID** checkbox.

**NOTE** In a multiple RAID configuration, one RAID volume must be designated as the Master RAID volume. The Master RAID volume will store all installed modules. If the Master RAID is changed to another location (i.e. assigning HDD 2 to be the Master RAID volume after HDD 1 had been previously assigned), then all modules must be reinstalled. In addition, all system folders that were contained on the Master RAID volume will be invisible. Reassigning this volume to be the Master RAID will make these folders visible again.

5. Tick the checkboxes under the “member” heading of the hard disks you wish to use to create a RAID.

6. Specify a stripe size — 64K is the default setting.

7. Specify the percentage allocated for user data. The remaining space will be made available for iSCSI target.

8. Selected the file system you like to have for this RAID volume.

| NOTE | Select ZFS file system while snapshot is needed It is only one ZFS file system allowed to be created per system.<br>ZFS file system is only accessible by CIFS/SMB, not for AFP and NFS users. |
|---|---|

9. Press ***Apply*** to build the RAID storage volume.

| NOTE | Building a RAID storage space may take time, depending on the size of hard drives and RAID mode. |
|---|---|
| **WARNING** | Creating RAID destroys all data in the current RAID volume. The data is unrecoverable. |

With a RAID 1, RAID 5, RAID 6, or RAID 10 volume, you can also add a spare disk after the RAID is created. See **Chapter 7: Tips and Tricks > Adding a Spare Disk** for details.

### *Expanding a RAID*

To expand a RAID 1, RAID 5, RAID 6, or RAID 10 volume, follow the steps below:

1. Replace one of the hard drives in the RAID volume and allow it to automatically rebuild.

2. Once rebuilt, you can continue to replace any remaining disks in the RAID array.

3. When you are done replacing hard drives, log on to Web Management. Navigate to **Storage** > ***RAID*** to open the **RAID List** screen.

4. On the **RAID List** screen, select the RAID volume by clicking on its radio button, and click ***RAID Config*** to open the **RAID Configuration** screen.

5. On the **RAID Configuration** screen, click ***Expand***.

### *Migrating a RAID*

Once a RAID volume has been created, you may want to move it to other physical drives or change the RAID array all together. To migrate a RAID 0, RAID 1, or RAID 5 volume, follow the steps below:

1. From the RAID Configuration screen, click Migrate RAID.

2. A list of possible RAID migration configurations will be listed. Select the desired migration scheme and click OK.

3. The system will begin migrating the RAID volume.

**NOTE** Migrating a RAID volume could take several hours to complete

Below is a table listing of possible RAID migration schemes:

| To➔ ↓ From | RAID 0 | RAID 5 |
|---|---|---|
| **RAID 0** | [RAID 0] HDDx2 to [RAID 0] HDDx3<br>[RAID 0] HDDx2 to [RAID 0] HDDx4<br>[RAID 0] HDDx2 to [RAID 0] HDDx5<br>[RAID 0] HDDx2 to [RAID 0] HDDx6<br>[RAID 0] HDDx2 to [RAID 0] HDDx7<br>[RAID 0] HDDx3 to [RAID 0] HDDx4<br>[RAID 0] HDDx3 to [RAID 0] HDDx5<br>[RAID 0] HDDx3 to [RAID 0] HDDx6<br>[RAID 0] HDDx3 to [RAID 0] HDDx7<br>[RAID 0] HDDx4 to [RAID 0] HDDx5<br>[RAID 0] HDDx4 to [RAID 0] HDDx6<br>[RAID 0] HDDx4 to [RAID 0] HDDx7<br>[RAID 0] HDDx5 to [RAID 0] HDDx6<br>[RAID 0] HDDx5 to [RAID 0] HDDx7<br>[RAID 0] HDDx6 to [RAID 0] HDDx7 | [RAID 0] HDDx2 to [RAID 5] HDDx3<br>[RAID 0] HDDx2 to [RAID 5] HDDx4<br>[RAID 0] HDDx2 to [RAID 5] HDDx5<br>[RAID 0] HDDx2 to [RAID 5] HDDx6<br>[RAID 0] HDDx2 to [RAID 5] HDDx7<br>[RAID 0] HDDx3 to [RAID 5] HDDx4<br>[RAID 0] HDDx3 to [RAID 5] HDDx5<br>[RAID 0] HDDx3 to [RAID 5] HDDx6<br>[RAID 0] HDDx3 to [RAID 5] HDDx7<br>[RAID 0] HDDx4 to [RAID 5] HDDx5<br>[RAID 0] HDDx4 to [RAID 5] HDDx6<br>[RAID 0] HDDx4 to [RAID 5] HDDx7<br>[RAID 0] HDDx5 to [RAID 5] HDDx6<br>[RAID 0] HDDx5 to [RAID 5] HDDx7<br>[RAID 0] HDDx6 to [RAID 5] HDDx7 |
| **RAID 1** | [RAID 1] HDDx2 to [RAID 0] HDDx2<br>[RAID 1] HDDx2 to [RAID 0] HDDx3<br>[RAID 1] HDDx2 to [RAID 0] HDDx4<br>[RAID 1] HDDx2 to [RAID 0] HDDx5<br>[RAID 1] HDDx2 to [RAID 0] HDDx6<br>[RAID 1] HDDx2 to [RAID 0] HDDx7<br>[RAID 1] HDDx3 to [RAID 0] HDDx3<br>[RAID 1] HDDx3 to [RAID 0] HDDx4<br>[RAID 1] HDDx3 to [RAID 0] HDDx5<br>[RAID 1] HDDx3 to [RAID 0] HDDx6<br>[RAID 1] HDDx3 to [RAID 0] HDDx7<br>[RAID 1] HDDx4 to [RAID 0] HDDx4<br>[RAID 1] HDDx4 to [RAID 0] HDDx5<br>[RAID 1] HDDx4 to [RAID 0] HDDx6<br>[RAID 1] HDDx4 to [RAID 0] HDDx7<br>[RAID 1] HDDx5 to [RAID 0] HDDx5<br>[RAID 1] HDDx5 to [RAID 0] HDDx6<br>[RAID 1] HDDx5 to [RAID 0] HDDx7<br>[RAID 1] HDDx6 to [RAID 0] HDDx6<br>[RAID 1] HDDx6 to [RAID 0] HDDx7<br>[RAID 1] HDDx7 to [RAID 0] HDDx7 | [RAID 1] HDDx2 to [RAID 5] HDDx3<br>[RAID 1] HDDx2 to [RAID 5] HDDx4<br>[RAID 1] HDDx2 to [RAID 5] HDDx5<br>[RAID 1] HDDx2 to [RAID 5] HDDx6<br>[RAID 1] HDDx2 to [RAID 5] HDDx7<br>[RAID 1] HDDx3 to [RAID 5] HDDx3<br>[RAID 1] HDDx3 to [RAID 5] HDDx4<br>[RAID 1] HDDx3 to [RAID 5] HDDx5<br>[RAID 1] HDDx3 to [RAID 5] HDDx6<br>[RAID 1] HDDx3 to [RAID 5] HDDx7<br>[RAID 1] HDDx4 to [RAID 5] HDDx4<br>[RAID 1] HDDx4 to [RAID 5] HDDx5<br>[RAID 1] HDDx4 to [RAID 5] HDDx6<br>[RAID 1] HDDx4 to [RAID 5] HDDx7<br>[RAID 1] HDDx5 to [RAID 5] HDDx5<br>[RAID 1] HDDx5 to [RAID 5] HDDx6<br>[RAID 1] HDDx5 to [RAID 5] HDDx7<br>[RAID 1] HDDx6 to [RAID 5] HDDx6<br>[RAID 1] HDDx6 to [RAID 5] HDDx7<br>[RAID 1] HDDx7 to [RAID 5] HDDx7 |
| **RAID 5** | **X** | [RAID 5] HDDx3 to [RAID 5] HDDx4<br>[RAID 5] HDDx3 to [RAID 5] HDDx5<br>[RAID 5] HDDx3 to [RAID 5] HDDx6<br>[RAID 5] HDDx3 to [RAID 5] HDDx7<br>[RAID 5] HDDx4 to [RAID 5] HDDx5<br>[RAID 5] HDDx4 to [RAID 5] HDDx6<br>[RAID 5] HDDx4 to [RAID 5] HDDx7<br>[RAID 5] HDDx5 to [RAID 5] HDDx6<br>[RAID 5] HDDx5 to [RAID 5] HDDx7<br>[RAID 5] HDDx6 to [RAID 5] HDDx7 |

### *Deleting a RAID*

To delete a RAID volume, follow the steps below:

1. On the RAID List screen, select the RAID volume by clicking on its radio button, and click ***RAID Config*** to open the **RAID Configuration** screen.

2. On the **RAID Configuration** screen, click ***Remove RAID***.

3. The confirmation screen appear, you will have to input "Yes" with exactly wording case to complete "**Remove RAID**" operation

**WARNING** Removing RAID destroys all data in the current RAID volume. The data is unrecoverable.

## Space Allocation

You may specify the space allocated for iSCSI volume.

To do this, under the **Storage** menu, click ***RAID*** and the **RAID List** window appears. Select the RAID volume you wish to reallocate by clicking on its radio button, and click ***Space Allocation***. The **RAID Information** and **Volume Allocation List** windows will appear.

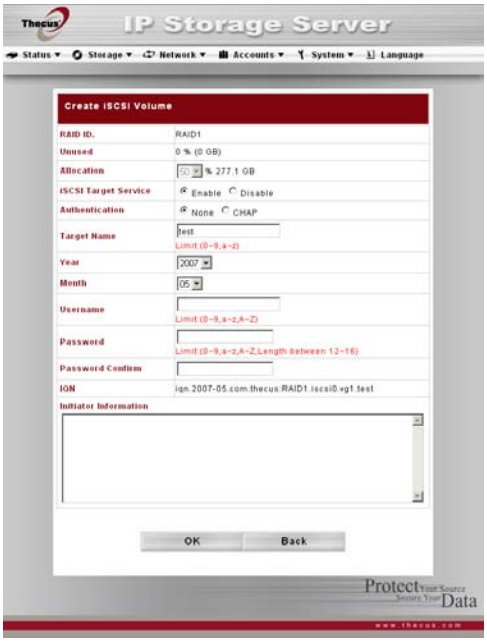
The Volume Allocation List displays the space allocated for **iSCSI** volumes on the current RAID volume. The N7700 supports up to **5** iSCSI volumes in each RAID volume.

| Volume Allocation List | |
|---|---|
| **Item** | **Description** |
| Modify | Click this to modify the allocated space. |
| Del | Click this to delete the allocated space. |
| Type | Type of volume. Can be either USB or iSCSI. |
| Name | Name assigned to the volume. |
| Capacity | Capacity of the allocated space. |
| iSCSI Target | Click to allocate space to iSCSI volume. |

### *Allocating Space for iSCSI Volume*

To allocate space for an iSCSI volume on the current RAID volume, follow the steps below:

1. Under the **Volume Allocation List**, click ***iSCSI Target***.




The **Create iSCSI Volume** screen appears.

| **Create iSCSI Volume** | |
|---|---|
| **Item** | **Description** |
| RAID ID | ID of current RAID volume. |
| Unused | Percentage and amount of unused space on current RAID volume. |
| Allocation | Percentage and amount of space allocated to iSCSI volume. |
| iSCSI Target Service | Enable or Disable the iSCSI Target service. |
| Authentication | You may choose CHAP authentication or choose None. |
| Target Name | Name of the iSCSI Target. This name will be used by the **Stackable NAS** function to identify this export share. |
| Year | Select the current year from the dropdown. |
| Month | Select the current month from the dropdown. |
| Username | Enter a username. |
| Password | Enter a password. |
| Password Confirm | Reenter the chosen password |
| IQN | The iSCSI Qualified Name |
| Initiator Information | Shows the name and status of iSCSI initiators logged on the system |
| OK | Click ***OK*** to save changes. |
| Back | Click ***Back*** to exit without saving. |

2. Designate the percentage to be allocated from the **Allocation** dropdown.

3. Enable the **iSCSI Target Service** by selecting ***Enable***.

4. Choose to enable ***CHAP*** authentication or choose ***None***.

5. Enter a **Target Name**. This will be used by the **Stackable NAS** function to identify this export share.

6. Choose the current year from the **Year** dropdown.

7. Choose the current month from the **Month** dropdown.

8. If you've enabled CHAP authentication, enter a **username** and a **password**. Confirm your chosen password be reentering it in the **Password Confirm** box.

9. Click ***OK*** to create the iSCSI volume.

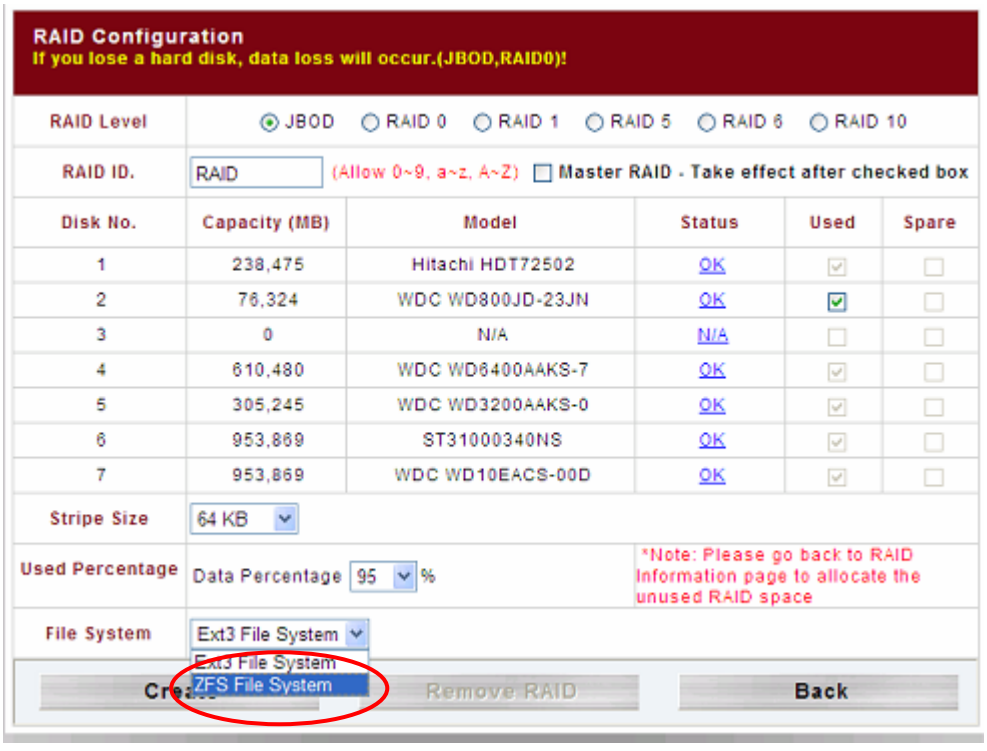
## Stackable NAS

The N7700's capacity can be expanded even further using the stackable function. With it, users can expand the capacity of their network storage systems with up to 5 other stack target volumes which are located in different systems. These can be stacked through single network access like SMB or AFP acting as a share folder type.

For detailed instructions on how to use this feature, please refer to the **Stackable User Guide**.

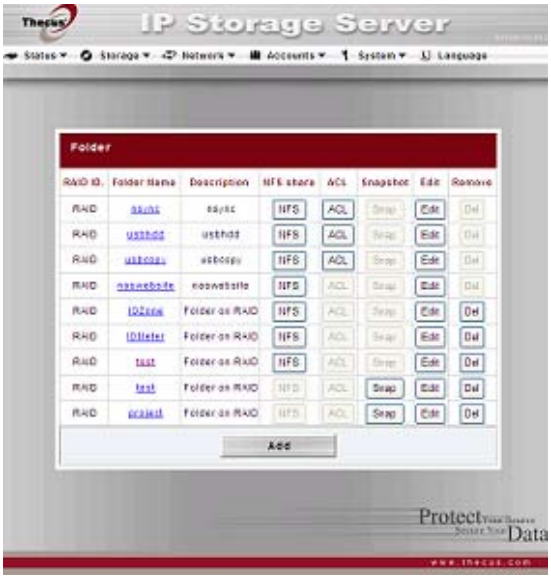
## Snapshot

The N7700 is capable for snapshot version control supported. To have snapshot to work on the file system creation for RAID volume has to be "ZFS". For more information how to using snapshot, please refer to next section "Folder management".



## Folder Management

From the **Storage** menu, choose ***Folder***, and the **Folder** screen appears. This screen allows you to create and configure folders on the N7700 volume.




| Folder | |
|---|---|
| **Item** | **Description** |
| Folder name | Displays the name of the folder. |
| Description | Provides a description of the folder. |
| NFS Share | Press ***NFS Share*** to configure which hosts on the network are allowed to access this folder using NFS.<br>With "ZFS" file system selected RAID volume, it is un-configurable. |
| ACL | Press ***ACL*** (Access Control List) to configure which users have access to this folder. |
| Edit | Press ***Edit*** to enter the **Edit** screen and modify the folder's name and description. |
| Snapshot | Press **Snap** to open snapshot configuration screen, the button will be only configurable with "ZFS" file system selected RAID volume. |
| Del | Press ***Del*** to delete the folder. A prompt appears asking to confirm the deletion. |
| Add | Press ***Add*** to enter the **Add Folder** screen. |

**NOTE** Nsync folders will be created once the RAID is created. Nsync folder is used by Nsync server. It will be used for files backed up by Nsync.

### *Adding Folders*

On the **Folder** screen, press the ***Add*** button and the **Add Folder** screen appears. This screen allows you to add a folder. After entering the information, press ***Apply*** to create new folder. Press ***Back*** to return to the **Folder** screen.

| Add Folder | |
|---|---|
| **Item** | **Description** |
| RAID ID | RAID volume where the new folder will reside. |
| Folder Name | Enter the name of the folder. |
| Description | Provide a description the folder. |
| Browseable | Enable or disable users from browsing the folder contents. If **Yes** is selected, then the share folder will be browseable. |
| Public | Admit or deny public access to this folder. If **Yes** is selected, then users do not need to have access permission to write to this folder. When accessing a public folder via FTP, the behavior is similar to anonymous FTP. Anonymous users can upload/download a file to the folder, but they cannot delete a file from the folder. |
| Share Folder Limit | Enter the maximum size of the folder in Gigabytes (GB). The folder cannot grow beyond this limit. You can enter a 0 to turn off the share folder limit. |
| Apply | Press ***Apply*** to create the folder. |
| Back | Press ***Back*** to return to the **Folder** screen. |

**NOTE** Folder names are limited to 60 characters. Systems running Windows 98 or earlier may not support file names longer than 15 characters.

### *Editing Folders*

On the **Folder** screen, press the ***Edit*** button and the **Edit Folder** screen appears. This screen allows you to change folder information. After entering the information, press ***Submit*** to apply the changes. Press ***Back*** to return to the **Folder** screen.

| Edit Folder | |
|---|---|
| **Item** | **Description** |
| Share Name | Enter the name of the (Share) folder. |
| Comment | Provide a description the folder. |
| Browseable | Enable or disable users from browsing the folder contents. This setting will only apply while access via SMB/CIFS and web disk. |
| Public | Admit or deny public access to this folder. |
| Share Limit | Enter the maximum size of the folder. The folder will not grow beyond this limit. You can enter a 0 to turn off the share folder limit. |
| Submit | Press ***Submit*** to save your changes. |
| Back | Press ***Back*** to return to the **Folder** screen. |

### *Deleting Folders*

To delete a folder, press the ***Del*** button from the specified folder row. The system will confirm folder deletion. Press ***OK*** to delete the folder permanently or ***Cancel*** to go back to the folder list.

**WARNING** All the data stored in the folder will be deleted once the folder is deleted. The data will not be recoverable.

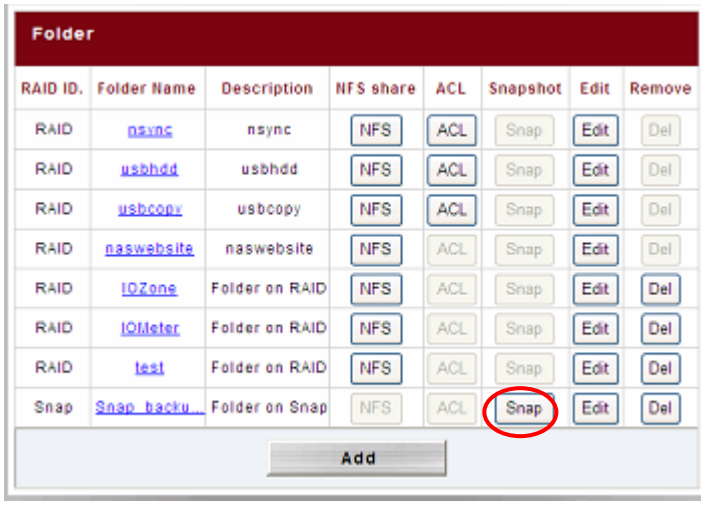
### *NFS Share*

To allow NFS access to the share folder, enable the **NFS Service**, and then set up hosts with access rights by clicking ***Add***.

| NFS Share | |
|---|---|
| **Item** | **Description** |
| Hostname | Enter the name or IP address of the host |
| Privilege | Host has either read only or writeable access to the folder. |
| Guest System Support | There are two selections available:<br>• Unix / Linux System<br>• AIX (Allow source port > 1024)<br>Choose the one which best fits your needs. |
| IO Mapping | There are three selections available:<br>• Guest system root account will have full access to this share (root:root).<br>• Guest system root account will be mapped to anonymous user (nobody:nogroup) on NAS.<br>• All user on guest system will be mapped to anonymous user (nobody:nogroup) on NAS.<br>Choose the one which best fits your needs. |
| Apply | Click to save your changes. |
| Back | Click to abandon changes. |

### *Snap (Snapshot configuration)*

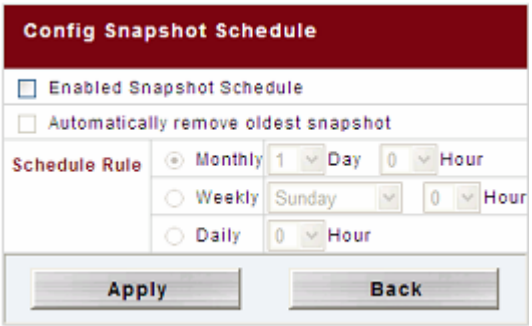
If added folder has located in the RAID volume with “ZFS” file system, then the folder management screen with “Snap” button will be configurable.


Folder
RAID ID.
Folder Name
Description
NFS share
ACL
Snapshot
Edit
Remove
RAID nsync nsync NFS ACL Snap Edit Del
RAID usbhdd usbhdd NFS ACL Snap Edit Del
RAID usbcopy usbcopy NFS ACL Snap Edit Del
RAID naswebsite naswebsite NFS ACL Snap Edit Del
RAID IOZone Folder on RAID NFS ACL Snap Edit Del
RAID IOMeter Folder on RAID NFS ACL Snap Edit Del
RAID test Folder on RAID NFS ACL Snap Edit Del
Snap Snap_backu... Folder on Snap NFS ACL Snap Edit Del
Add

Clicking on “Snap” then screen appears as following.

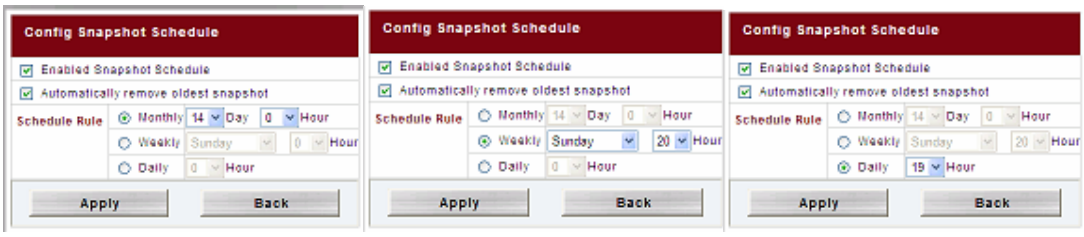
| Snapshot | |
|---|---|
| **Item** | **Description** |
| Take Shot | Click to take snapshot right away. |
| Schedule | Click to open snapshot schedule setup screen. |
| Back | Click to go back folder management screen. |

Clicking on schedule button then schedule setup screen appear. Checked the enable check box to activate the snapshot scheduled operation.



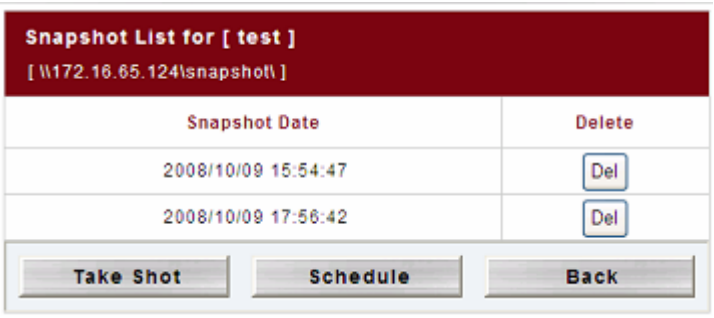
The N7700 snapshot is supported total **16 versions**. Once checked "Automatically remove oldest snapshot", the oldest will be removed to let newest to added on top. Otherwise, if the check box is unchecked and snapshot versions are up to 16 then system will appear warning message and won't execute the task till available version count.

The snapshot schedule rules can be setup for monthly, weekly or daily hour.




Clicking on ***Apply*** after firmed with desired schedule or click **back** to Snap screen.

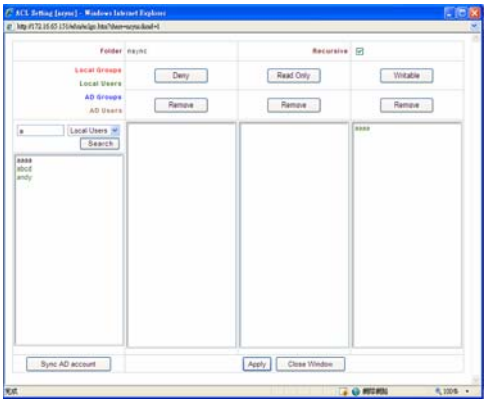
If any snapshot has taken then it will listed in Snapshot list as example below. This example shows folder "test" has created under RAID volume in ZFS file system. It has been taken snapshot twice so far at time displayed.




These taken snapshot is only accessible though CIFS/SMB by manually type **\\NAS IP address\snapshot** and invisible from normal access. Also, the taken snapshot version is read only can not be deleted under CIFS/SMB access but only click the "Del" button showing on the screen shot above.

### *Folder Access Control List (ACL)*

On the Folder screen, press the ***ACL*** button, and the **Access Control List** screen appears. This screen allows you to configure access to the specific folder for users and groups. Select a user or a group from the left hand column and then choose ***Deny***, ***Read Only***, or ***Writable*** to configure their access level. Press the ***Submit*** button to confirm your settings.



| Access Control List | |
|---|---|
| **Item** | **Description** |
| Deny | Denies access to users or groups who are displayed in this column. |
| Read Only | Provides Read Only access to users or groups who are displayed |

| | |
|---|---|
| | in this column. |
| Writable | Provides Write access to users or groups who are displayed in this column. |
| Remove | Removes the selected user or group from the column in order to reset their access privileges. |
| Sync AD account | Press this button when there is no list from ADS/PDC or more ADS user has been added but yet appear from list. |
| Submit | Submits and confirms settings. |
| Reset | Cancel your settings and return to the **Folder** screen. |

To configure folder access, follow the steps below:

1. On the **ACL** screen, all network groups and users are listed in the left hand column. Select a group or user from this list.

2. With the group or user selected, press one of the buttons from the three access level columns at the top. The group or user then appears in that column and has that level of access to the folder.

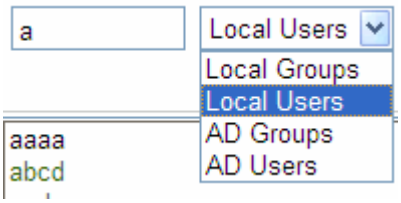
3. Continue selecting groups and users and assigning them access levels using the column buttons.

4. To remove a group or user from an access level column, press the ***Remove*** button in that column.

5. When you are finished, press ***Submit*** to submit and confirm your ACL settings.

**NOTE** If one user has belonged to more than one group but different privilege than the priority Deny > Read Only > Writable

The ACL screen also allows you to search for a particular user. To do this, follow the steps below:




1. In the blank, enter the name of the user you would like to find.

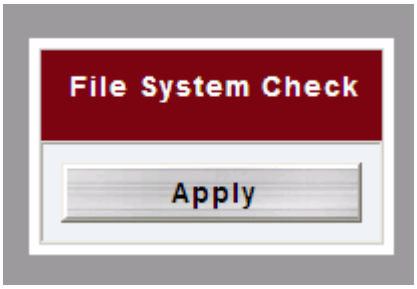
2. From the drop down select the group you would like to search for the user in.

3. Click ***Search***.

**NOTE** The system will list up to 1,000 users from the chosen category. To narrow your search, enter a search term in the blank provided.

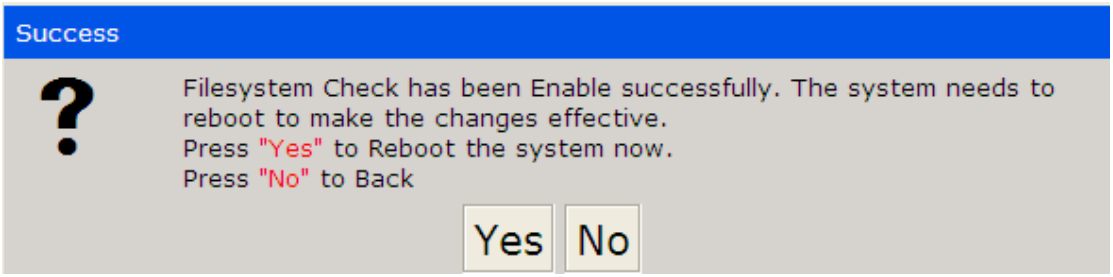
## File System Check

The File System Check allows you to perform a check on the integrity of your disks' file system. Under the **Storage** menu, click ***Filesystm Check*** and the **File System Check** prompt appears.




To perform a file system check, click ***Apply***.

Once clicked, the following prompt will appear:

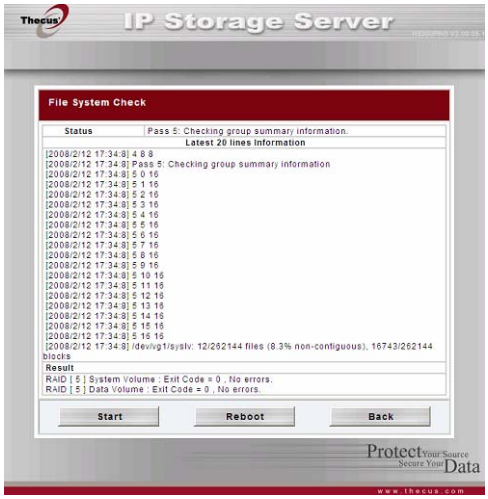

Success
Filesystem Check has been Enable successfully. The system needs to reboot to make the changes effective.
Press "Yes" to Reboot the system now.
Press "No" to Back
Yes
No

Click ***Yes*** to reboot the system.

Once the system has rebooted, you will be returned to the **File System Check** prompt. There you will see the available RAID volumes to run the file system check on. Check the desired RAID volumes and click ***Next*** to proceed with the file system check. Click ***Reboot*** to reboot without running the check.

Once you click ***Next***, you will see the following screen:

Click ***Start*** to begin the file system check. Click ***Back*** to return to the previous screen. Click ***Reboot*** to reboot the system.
When the file system check is run, the system will show 20 lines of information until it is complete. Once complete, the results will be shown at the bottom.

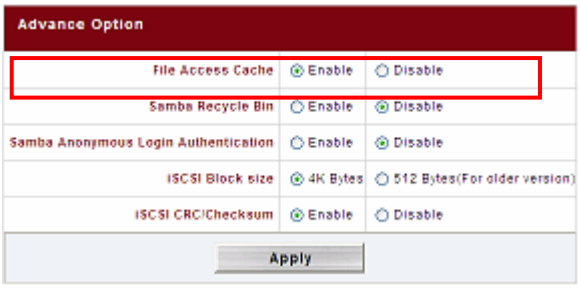



**NOTE** The system must be rebooted before the N7700 can function normally.

## Advance Option

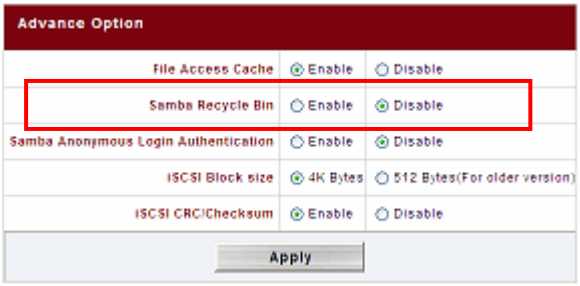
There are 5 items is currently allow Admin to Enable/Disable to operate N7700. The details as listed in following screenshot. With the option changed, it will need to reboot system to activate.

### *File Access Cache*

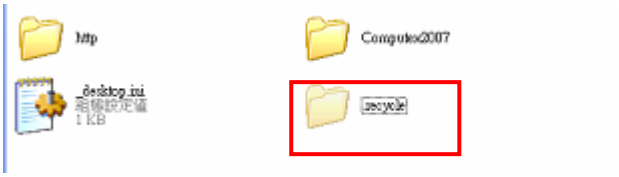



File Access Cache is default **Enable**. This option will help to increase the performance while single client access share folder in writing under SMB/CIFS protocol.

### *Samba Recycle Bin*

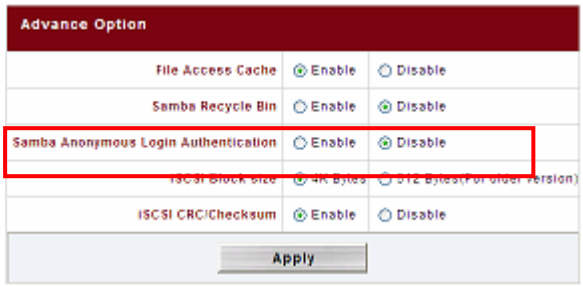



The N7700 is supported recycle bin via SMB/CIFS protocol. Simply enable it then all of deleted files/folders will reside in the ".recycle" folder with hidden attribution in each share.



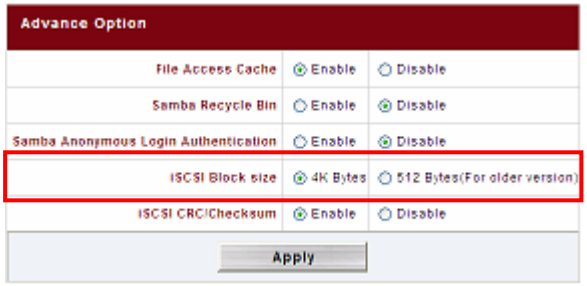

In general, Windows has default to invisible all of hidden folders/files. So please enable this option to view ".recycle" folder.

### *Samba Anonymous Login Authentication*



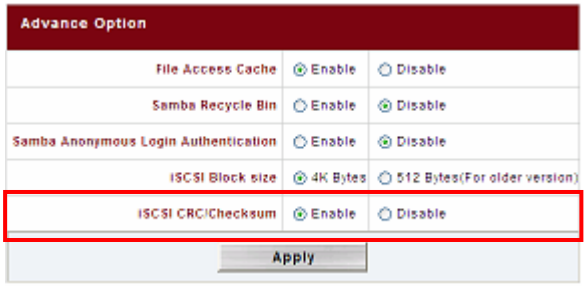

To enable this option, no matter there is share folder has been created in public access. The user account and password is needed from system to access under SMB/CIFS protocol. On the other hand, no more anonymous logAdvance Option

### *iSCSI Block Size*

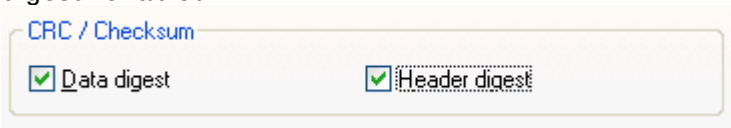



Select the block size with 4K while the iSCSI volume size is over 2TB.

### *iSCSI CRC/Checksum*




To enable this option, the initiator can connect with “Data digest” and “Header digest” enabled.

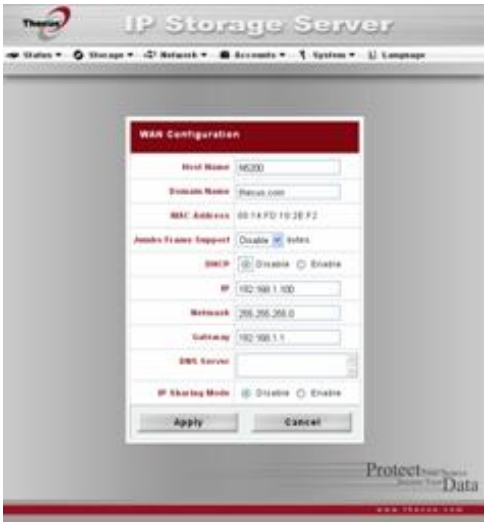



## *Network Management*

Use the **Network** menu to make network configuration settings as well as service support settings.

### WAN Configuration

From the **Network** menu, choose ***WAN***, and the **WAN Configuration** screen appears. This screen displays the network parameters of the WAN connection. You may change any of these items and press ***Apply*** to confirm your settings. See a description of each item in the following table:




| WAN Configuration | |
|---|---|
| **Item** | **Description** |
| Host name | Host name that identifies the N7700 on the network. |
| Domain name | Specifies the domain name of the N7700. |
| MAC Address | MAC address of the network interface. |
| Jumbo Frame Support | Enable or disable Jumbo Frame Support of the WAN interface on your N7700. |
| DHCP | Enable or disable the N7700 from obtaining in IP address via DHCP server. If you require a static IP, disable this feature and input your network configuration. |
| IP | IP address of the WAN interface. |
| Netmask | Network mask, which is generally: 255.255.255.0 |
| Gateway | Default Gateway IP address. |
| DNS Server | Domain Name Service (DNS) server IP address. |
| IP Sharing Mode | When enabled, PCs connected to the LAN port will be able to access the WAN. Default is Enabled. |
| Link Aggregation | Specifies whether WAN and LAN ports will be aggregated and |

| | |
|---|---|
| | act as one port.<br>**Failover**: When one port fails, the other one will take over.<br>**Load Balance**: Ethernet traffic will flow alternative between two Ethernet ports.<br>**802.3ad**: Linkage two Ethernet ports in parallel to increase throughput. |

**NOTE**

- Only use Jumbo Frame settings when operating in a Gigabit environment where all other clients have Jumbo Frame Setting enabled.
- Enabling DHCP automatically turns on UPnP—see the Service Support Screen.
- If you are only using the WAN port, we suggest that you disable IP Sharing Mode. This will result in higher throughput.
- A correct DNS setting is vital to networks services, such as SMTP and NTP.
- To use the Link Aggregation with "802.3ad selected" feature, please make sure the networking equipment on the other end of Ethernet cable also supports 802.3ad protocol.

**WARNING**

Most Fast Ethernet (10/100) Switches/Routers do not support Jumbo Frame and you will not be able to connect to your N7700 after Jumbo Frame is turned on. If this happens, turn off the N7700. Then, insert USB disk with factory reset utility included and power on the N7700. Till the system power on complete then it will bring your system settings back to factory default.

## LAN Configuration

The N7700 supports two Gigabit Ethernet ports for higher service availability. To configure these ports, choose ***LAN*** from the **Network** menu, and the **LAN Configuration** screen appears. Press ***Apply*** to save your changes.

| LAN Configuration | |
|---|---|
| **Item** | **Description** |
| MAC Address | Displays the MAC address of the LAN interface. |
| IP | Specifies the IP address of the LAN interface. |
| Netmask | Specifies the Network Mask of the LAN interface. |
| Jumbo Frame Support | Enable or disable Jumbo Frame Support on the LAN interface. |

**NOTE**

Before enabling Jumbo Frame Support, please make sure your network equipment supports Jumbo Frame. If your equipment is incompatible, you might not be able to connect to your N7700.

## DHCP Configuration

A DHCP server can be configured to assign IP addresses to devices connected to the LAN port. To configure these ports, choose ***LAN*** from the **Network** menu.

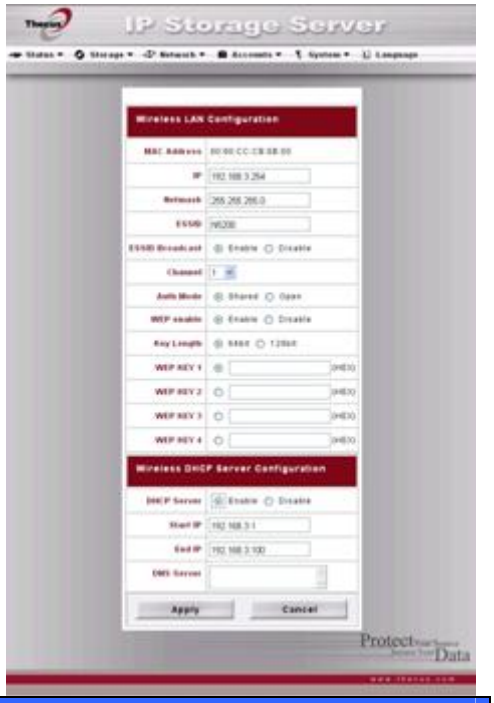
| DHCP Configuration | |
|---|---|
| **Item** | **Description** |
| DHCP Server | Enable or disable the DHCP server to automatically assign IP address to PCs connected to the LAN interface. |
| Start IP | Specifies the starting IP address of the DHCP range. |
| End IP | Specifies the ending IP address of the DHCP range. |
| DNS Server | Displayed the DNS server IP address. |

**NOTE** The IP Segment of WAN and LAN should not overlap.

**WARNING** The IP address of the LAN interface should not be in the range of the Start IP address and End IP address.

## WLAN Configuration

When a compatible wireless USB dongle is installed on the N7700, the N7700 will become an access point, and the **Network** dropdown menu will contain a **WLAN** menu item. From the **Network** menu, choose ***WLAN***, and the **WLAN Configuration** screen appears. This screen displays the wireless network parameters of the system. You can change any of these items and press ***Apply*** to confirm your settings.




**NOTE**

- Currently supported USB wireless dongles are: 3Com 3CRUSB10075, Zyxel G220USB, PCI GW-US54mini.
- USB dongles have to be connected before N7700 is powered up.

| WLAN Configuration | |
|---|---|
| **Item** | **Description** |
| MAC Address | Displays the MAC Address of the USB wireless dongle. |
| IP | Specifies the IP address of the network connection. |
| Netmask | Specifies the network mask, which is generally: 255.255.255.0 |
| ESSID | The ESSID (Extended Service Set Identification) is the identifying name of a wireless network. |
| ESSID Broadcast | Specifies whether the ESSID will be broadcasted by the N7700. This will prevent the Access Point from broadcasting the ESSID. The N7700 will still respond to a wireless device that wants to communicate if it sends a matching ESSID. |
| Channel | The channel that the N7700 uses to communicate with client devices. |
| Auth Mode | Authentication mode used by the N7700.<br>**Shared:** Shared key authentication<br>**Open:** Open key authentication |
| WEP Enable | Specifies whether to use encryption for transmission or not. |
| Key Length | Key length specifies the level of encryption used by the N7700.<br>64 bit: 10 characters from 0 ~ 9 and A ~ F.<br>128 bit: 26 characters from 0 ~ 9 and A ~ F. |
| WEP KEY 1 | Input up to 4 WEP keys, and select the one you wish to use. |

| | |
|---|---|
| WEP KEY 2 | When connecting, be sure to enter the same key and select the same index number on each client machine. |
| WEP KEY 3 | |
| WEP KEY 4 | |

A DHCP server can be configured to assign IP addresses to devices connected to LAN ports.

| WLAN DHCP Configuration | |
|---|---|
| **Item** | **Description** |
| DHCP Server | Select to enable or disable DHCP server. |
| Start IP | Specifies the starting IP address of the DHCP range. |
| End IP | Specifies the ending IP address of the DHCP range. |
| DNS Server | Specifies the DNS server IP address. |

**NOTE**

The IP Segment of WLAN, WAN and LAN should not overlap.

**NOTE**

Users should obey the international RF regulatory rules as they set up the wireless RF channel on the N7700. The RF operating channels for different regions have been specified as following. Thecus has no responsibility for users attempting to violate the international RF regulation.

| | |
|---|---|
| 11 | N. America |
| 14 | Japan |
| 13 | Europe (ETSI) |
| 2 | Spain |
| 4 | France |

## Web Services Configuration

From the **Network** menu, choose the ***Service*** item, and the **Web Service** screen appears. This screen displays the service support parameters of the system. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

**NOTE**

- Disable HTTP support and Enable Secure HTTP support to guarantee secure access.
- In some environments, due to security concerns, you may wish to disable SMB/CIFS as a precaution against computer viruses.

| Web Service | |
|---|---|
| **Item** | **Description** |
| HTTP (WebDisk) Support | Enable or disable WebDisk support. Enter the port number if this option is enabled. The port number |
| HTTPs (Secure WebDisk) Support | Enable or disable secure WebDisk support. Enter the port if this option is enabled. |
| SMB/CIFS | Enable or Disable SMB/CIFS protocol for Windows, Apple, Unix drive mapping. |
| UPnP | Enable or disable Universal Plug and Play protocol. UPnP helps to find the IP address of the N7700. |

## AFP (Apple Network Setup)

From the **Network** menu, choose the ***AFP*** item, and the **AFP Configuration** screen appears. This screen displays the configuration items for the Apple Filing Protocol. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

| Apple Network Configuration | |
|---|---|
| **Item** | **Description** |
| AFP Server | Enable or disable Apple File Service to use the N7700 with MAC OS-based systems. |
| Zone | Specifies Zone for Applet Talk service.<br>If your AppleTalk network uses extended networks and is assigned with multiple zones, assign a zone name to the N7700. If you do not want to assign a network zone, enter an asterisk (*) to use the default setting. |

## NFS Setup

From the **Network** menu, choose the ***NFS*** item, and the **NFS Server Setting** screen appears. The N7700 can act as an NFS server, enabling users to download and upload files with the favorite NFS clients. Press ***Apply*** to confirm your settings. A description of each item follows:

| NFS Server Setting | |
|---|---|
| **Item** | **Description** |
| NFS | **Enable** or **Disable** NFS support. |
| Apply | Click ***Apply*** to save your changes. |
| Cancel | Click ***Cancel*** to abandon your changes. |

# *User and Group Management*

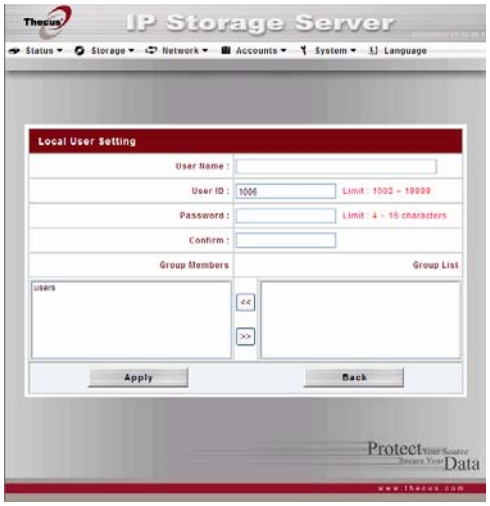
The N7700 has built-in user database that allows administrators to manage user access using different group policies. From the **Accounts** menu, you can create, modify, and delete users, and assign them to groups that you designate.

## Local User Configuration

From the **Accounts** menu, choose the **Users** item, and the **Local User Configuration** screen appears. This screen allows you to **Add**, **Modify**, and **Delete** local users.

| Local User Configuration | |
|---|---|
| **Item** | **Description** |
| Add | Press the ***Add*** button to add a user to the list of local users. |
| Modify | Press the ***Modify*** button to modify a local user. |
| Delete | Press the ***Delete*** button to delete a selected user from the system. |

### *Adding Users*




1. Click on the ***Add*** button on **Local User Configuration** screen, and **Local User Setting** screen appears.
2. On the **Local User Setting** screen, enter a name in the **User Name** box.
3. Enter a **User ID** number. If left blank, the system will automatically assign one.
4. Enter a password in the **Password** box and re-enter the password in the **Confirm** box.
5. Select which group the user will belong to. **Group Members** is a list of groups this user belongs to. **Group List** is a list of groups this user does not belong to. Use the **<<** or **>>** buttons to have this user join or leave a group.
6. Press the ***Apply*** button and the user is created.

**NOTE** All users are automatically assigned to the 'users' group.

### *Modifying Users*

1. Select an existing user from the **Local User Configuration** screen.
2. Click on the ***Modify*** button, and **Local User Setting** screen appears.
3. From here, you can enter a new password and re-enter to confirm, or use the **<<** or **>>** buttons to have this user join or leave a group. Click the ***Apply*** button to save your changes.

### *Deleting Users*

1. Select an existing user from the **Local User Configuration** screen.
2. Click on ***Delete*** button and the user is deleted from the system.

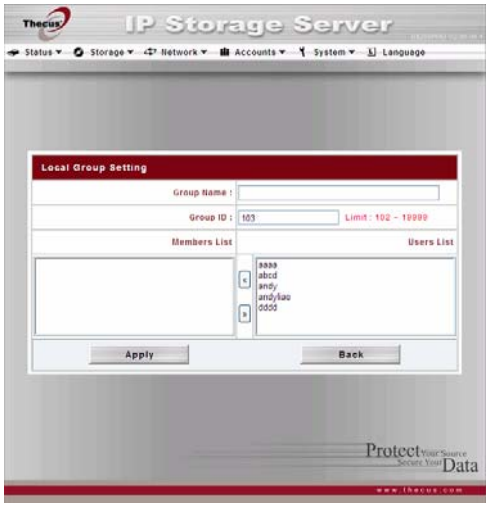
## Local Groups Configuration

From the **Accounts** menu, choose the ***Groups*** item, and the **Local Groups Configuration** screen appears. This screen allows you to **Add**, **Modify**, and **Delete** local groups.

| Local Groups Configuration | |
|---|---|
| **Item** | **Description** |
| Add | Press the ***Add*** button to add a user to the list of local groups. |
| Modify | Press the ***Modify*** button to delete a selected group from the system. |
| Delete | Press the ***Delete*** button to delete a selected group from the system. |

### *Adding Groups*

1. On the **Local Group Configuration** screen, click on the ***Add*** button.
2. The **Local Group Setting** screen appears.
3. Enter a **Group Name**.
4. Enter a **Group ID** number. If left blank, the system will automatically assign one.
5. Select users to be in this group from the **Users List** by adding them to the **Members List** using the **<<** button.
6. Click the ***Apply*** button to save your changes.




### *Modifying Groups*

1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press the ***Modify*** button to modify the members in a group.
3. To add a user into a group, select the user from the **Users List**, and press the **<<** button to move the user into the **Members List**.
4. To remove a user from a group, select the user from **Members List**, and press the **>>** button.
5. Click the ***Apply*** button to save your changes.

### *Deleting Groups*

1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press ***Delete*** to delete the group from the system.

## Batch User and Group Creation

The N7700 can also add users and groups in batch mode. This enables you to conveniently add numerous users and groups automatically by importing a simple comma-separated plain text (*.txt) file.

From the **Accounts** menu, click ***Batch Mgmt*** and the **Batch Create Users and Groups dialogue** will appear. To import your list of users and groups, follow these steps:

1. Click ***Browse…*** to locate your comma-separated text file. The information in the text file should follow this format:

   `[USERNAME], [PASSWORD], [GROUP]`

2. Click ***Open***.
3. Click ***Import*** to begin the user list import.

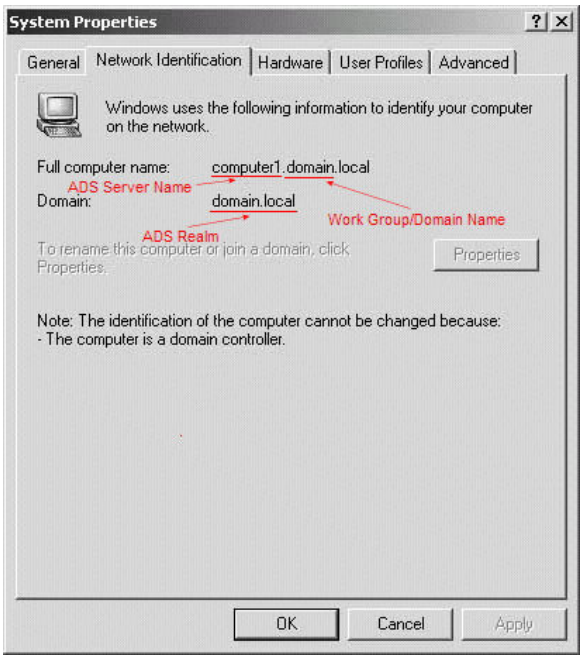
## ADS/NT Configuration

If you have a Windows Active Directory Server (ADS) or Windows NT server to handle the domain security in your network, you can simply enable the ADS/NT support feature; the N7700 will connect with the ADS/NT server and get all the information of the domain users and groups automatically. From the **Accounts** menu, choose ***Authentication*** item and the **ADS / NT Support** screen appears. You can to change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

| **ADS / NT Support** | |
|---|---|
| **Item** | **Description** |
| WINS Server | Specifies the WINS server if necessary. |
| Work Group / Domain Name | Specifies the SMB/CIFS Work Group / ADS Domain Name (e.g. N7700). |
| ADS/NT Support | Select Disable to disable authentication through Windows Active Directory Server or Windows NT. |
| Authentication Method | Select ADS for Windows Active Directory Server, or select NT for Windows NT |
| ADS/NT Server Name | Specifies the ADS/NT server name (e.g. adservername). |

| | |
|---|---|
| ADS/NT Realm | Specifies the ADS/NT realm (e.g. example.com). |
| Administrator ID | Enter the administrators ID of Windows Active Directory or Windows NT, which is required for N7700 to join domain. |
| Administrator Password | Enter the ADS/NT Administrator password. |
| Confirm Password | For re-entering password to confirm. |

To join an AD domain, you can refer the figure and use the example below to configure the N7700 for associated filed input:




| **AD Domain Example** | |
|---|---|
| **Item** | **Information** |
| Work Group / Domain Name | domain |
| ADS Support | Enable |
| ADS Server Name | Computer1 |
| ADS/NT Realm | Domain.local |
| Administrator ID | Administrator |
| Administrator Password | ********** |
| Confirm Password | ********** |

**NOTE**

- The DNS server specified in the WAN configuration page should be able to correctly resolve the ADS server name.
- The time zone setting between N7700 and ADS should be identical.
- The system time difference between N7700 and ADS should be less than five minutes.
- The Administrator Password field is for the password of ADS (Active Directory Server) not N7700.

## *System Settings*

The **System** menu gives you a wealth of settings that you can use to configure your N7700's system administration functions. You can set up system notifications, view system logs, and even upgrade firmware from this menu.

## System Notifications

From the **System** menu, choose the ***Notification*** item, and the **Notification Configuration** screen appears. This screen lets you have the N7700 notify you in case of any system malfunction. Press ***Apply*** to confirm all settings. See following table for a detailed description of each item.

**NOTE**

Consult with your mail server administrator for email server information.

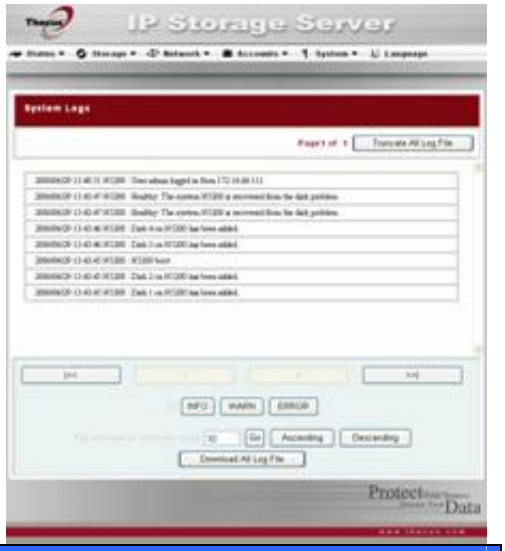
| Notification Configuration | |
|---|---|
| **Item** | **Description** |
| Beep Notification | Enable or disable the system beeper that beeps when a problem occurs. |
| Email Notification | Enable or disable email notifications of system problems. |
| SMTP Server | Specifies the hostname/IP address of the SMTP server. |
| Port | Specifies the port to send outgoing notification emails. |
| Auth Type | Select the SMTP Server account authentication type. |
| SMTP Account ID | Set the SMTP Server Email account ID. |
| Account Password | Enter a new password. |
| Confirm Account Password | Confirm a new password. |
| Receiver's E-mail Address | Add one or more recipient's email addresses to receive email notifications. |
| Test E-Mail | Click to send out a test e-mail to make sure the settings are correct. |

## SNMP

From the **System** menu, choose the **SNMP** item and the **SNMP Supports** screen appears. You could enable the SNMP function and filled in the related information in each fields. With the SNMP management software could get system basic information.

## System Logs

From the **System** menu, choose the **Logs** item and the **System Logs** screen appears. This screen shows a history of system usage and important events such as disk status, network information, and system booting. See the following table for a detailed description of each item:




| System Logs | |
|---|---|
| **Item** | **Description** |
| Truncate All Log File | Clear all log files. |
| \|<< < > >>\| | Use the forward ( **> >>\|** ) and backward ( **\|<< <** ) buttons to browse the log pages. |
| INFO | Provides all log information including warning messages and error messages. |
| WARN | Shows all warning messages and error messages. |
| ERROR | Shows only error messages. |
| GO | Specify the number of lines per page and press Go. |
| Ascending | Shows logs by date in ascending order. |
| Descending | Shows logs by date in descending order. |
| Download All Log File | Export all logs to an external file. |

## Time and Date Settings

From the **System** menu, choose the **Time** item and the **Time** screen appears. Set the desired **Date**, **Time**, and **Time Zone**. You can also elect to synchronize the system time on the N7700 with an **NTP (Network Time Protocol) Server**. You can change any of these items and press ***Apply*** to confirm your settings.

See the following table for a detailed description of each item:

| Time | |
|---|---|
| **Item** | **Description** |
| Date | Sets the system date. |
| Time | Sets the system time. |
| Time Zone | Sets the system time zone. |
| NTP Server | Select ***Yes*** to allow the N7700 to synchronize with the NTP server shown below.<br>Select ***Manually*** to allow the N7700 to synchronize with an NTP server of your choice.<br>Select ***No*** to not have the N7700 to synchronize with an NTP server. |

**WARNING** If an NTP server is selected, please make sure your N7700's network has been setup to access the NTP server.

## System Configuration Backup and Restore

From the **System** menu, choose the ***Config Mgmt*** item and the **System Configuration Download / Upload** screen appears. From here, you can download or upload stored system configurations. See the following table for a detailed description of each item.

| System Configuration Download / Upload | |
|---|---|
| **Item** | **Description** |
| Download | Save and export the current system configuration. |
| Upload | Import a saved configuration file to overwrite current system configuration. |

**NOTE** Backing up your system configuration is a great way to ensure that you can revert to a working configuration when you are experimenting with new system settings.
The system configuration you have backup can be only restore in same firmware version. And the backup details have excluded user/group accounts.

## Module Management

From the **System** menu, choose the ***Module Mgmt*** item and the **Module Management** screen appears. From here, you can install separate software modules to extend the functionality of your N7700.

| Module Management | |
|---|---|
| **Item** | **Description** |
| Name | Displays the name of the module. |
| Version | Displays the module version. |
| Description | The description of the module. |
| Enable | Displays whether the module has been enabled or not. |
| Status | Displays the status of the module. |
| Uninstall | Click to uninstall the module. |

| | |
|---|---|
| Enable/Disable | Click to enable a module. |
| Check Update | Click to look for updates for the selected module. |
| Module File | Location of the module file. |
| Browse | Click to browse the folder of your PC to locate the module files. |
| Install | Click to install the listed module into your N7700 |

**NOTE**

Modules can potentially harm your system. Only install modules from your vendor, or publishers you can trust.

## Reset to Factory Default Settings

From the **System** menu, choose the ***Factory Default*** item and the **Reset to Factory Default** screen appears. Press ***Apply*** to reset the N7700 to factory default settings. Press ***Cancel*** to go back to the main menu.

**WARNING**

Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

## Upgrading System Firmware

From the **System** menu, choose the ***Firmware Upgrade*** item and the **Firmware Upgrade** screen appears.

Follow the steps below to upgrade your firmware:

1. Use the ***Browse*** button to find the firmware file.
2. Press ***Apply***.
3. The beeper beeps and the Busy LED blinks until the upgrade is complete.

**NOTE**

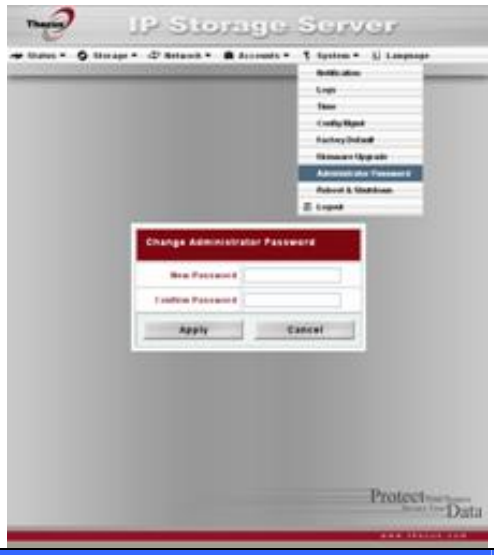
- The beeper only beeps if it is enabled in the System Notification menu.
- Check Thecus website for the latest firmware release and release notes.

**WARNING**

Do NOT turn off the system during the firmware upgrade process. This will lead to a catastrophic result that may render the system inoperable.

## Change Administrator Password

From the **System** menu, choose the ***Administrator Password*** item and the **Change Administrator Password** screen appears. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press ***Apply*** to confirm password changes. See the following table for a detailed description of each item.




| Change Administrator Password | |
|---|---|
| **Item** | **Description** |
| New Password | Type in a new administrator password. |
| Confirm Password | Type the new password again to confirm. |
| Apply | Press this to save your changes. |

## Reboot and Shutdown System

From the **System** menu, choose **Reboot & Shutdown** item, and the **Shutdown/Reboot System** screen appears. Press ***Reboot*** to restart the system or ***Shutdown*** to turn the system off.

## Logout

To logout of the Web Administration Interface, navigate to ***System*** > ***Logout***.

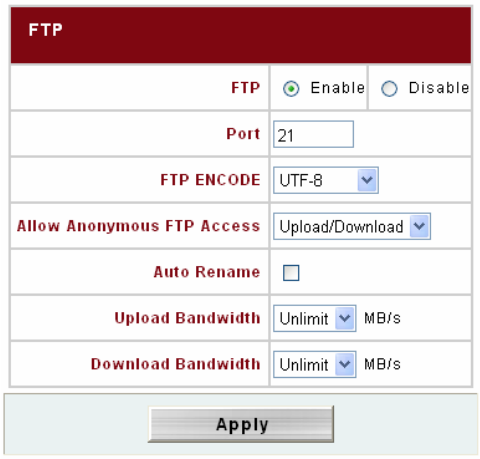
# Chapter 5: Additional Feature Setup

## *Overview*

The N7700 can also act as an FTP Server, allowing employees and clients to transfer files using their favorite FTP programs. The integrated Print Server allows you to share a single USB printer will all users on the network. The following section shows you how.

## *FTP Server*

N7700 can act as a FTP server, enabling users to download and upload files with their favorite FTP programs. From the **Network** menu, choose the ***FTP*** item, and the **FTP** screen appears. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:




| FTP | |
|---|---|
| **Item** | **Description** |
| FTP | Enable FTP Service on the N7700. |
| Port | Specifies the port number of an incoming connection on a non-standard port. |
| FTP ENCODE | If your FTP client or operating system does not support Unicode (e.g. Windows® 95/98/ME or MAC OS9/8), select the same encoding as your OS here in order to properly view the files and directories on the server. Available options are BIG5, HZ, GB2312, GB18030, ISO, EUC-JP, SHIFT-JIS and UTF-8. |
| Allow Anonymous FTP Access | **Upload / Download:** Allow anonymous FTP users to upload or download files to/from public folders.<br>**Download:** Allow anonymous FTP users to download files from public folders.<br>**No access:** Block anonymous FTP user access. |
| Auto Rename | If checked, the system will automatically rename files that are uploaded with a duplicate file name. The renaming scheme is `[filename].#`, where # represents an integer. |
| Upload Bandwidth | You may set the maximum bandwidth allocated to file uploads. Selections include **Unlimited, 1, 2, 4, 8, 16** and **32 MB/s.** |
| Download Bandwidth | You may set the maximum bandwidth allocated to file downloads. Selections include **Unlimited, 1, 2, 4, 8, 16** and **32 MB/s.** |

To access the share folder on the N7700, use the appropriate user login and password set up on the **Users** page (***Accounts*** > ***Users***). Access control to each share folder is set up on the **ACL** page (***Storage*** > ***Folder*** > ***ACL***).

## *iTunes® Server*

With the built-in iTunes server capability, the N7700 enables digital music to be shared and played anywhere on the network!

From the **Network** menu, choose the ***iTunes*** item, and the **iTunes Configuration** screen appears. You may enable or disable the iTunes Service from here. Once enabled, enter correct information for each field and press ***Apply*** to save your changes. See the following table for detailed descriptions of each field:

| iTunes Configuration | |
|---|---|
| **Item** | **Description** |
| iTunes | Enable or disable the iTunes Service. |
| Server Name | Name used to identify the N7700 to iTunes clients. |
| Password | Enter password to control access to your iTunes music. |
| Rescan Interval | Rescan interval in seconds. |
| MP3 Tag Encode | Specify tag encoding for MP3 files stored in N7700. All ID3 tags will be sent out in UTF-8 format. |

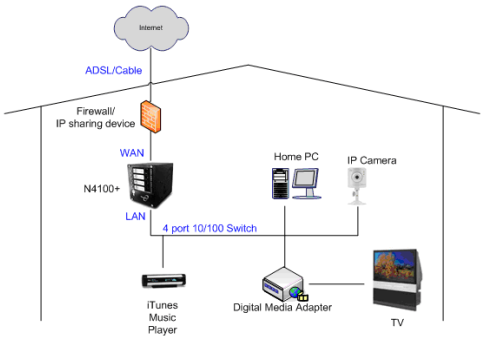
Once the iTunes service is enabled, the N7700 will make all music located in the **Music** folder available for iTunes-equipped computers on the network.

## *Media Server*

With the built-in Media Server capability, the N7700 provides media streaming service to stand-alone networked home media adapters that support the UPnP AV protocol or are Digital Living Network Alliance (DLNA) standard compliant.

With the N7700's built-in media server capability, you can share digital media such as music, pictures, and movies with any compatible device throughout your entire home.

To configure the media server, under the Network menu, click Media Server and the Media Manager Settings window will appear. A description of each field follows:



| Media Manager Settings | |
|---|---|
| **Item** | **Description** |
| Media Server | Enable or disable the Media Server service. |
| Shared Media Folders | Select the folder(s) that contains media files to be shared. |
| Rescan | Click the ***Rescan*** button to have the N7700 for new contents in the selected media folder. |

### Adding Media Share Folders

Once the Media Server software is installed, you can start adding folders that contain the media that you would like to share. To create a media share folder, follow the steps below:

1. Click on ***Network*** > ***Media Server*** in the menu bar.

2. From the **Shared Media Folders** window, select the folder that contains your media files, and click its checkbox.

3. The contents in the folder will be scanned for the Media Server. The time required for scanning depends on the size of the folder.

### Connecting DMAs to the Media Server

Next, it's time to connect your Digital Media Adapter (DMA) to the media server:

1. Connect your DMA to your Media Server

    a. Configure your DMA to use a Dynamic IP address. The IP address will be assigned by the router.
    b. Some DMAs are wireless enabled. You can connect the DMA to a wireless router. For instructions on how to connect your DMA to a wireless router, please refer to your DMA's user manual.

2. Connect your DMA's video output to video input of your TV set.

3. Turn on the TV and change the video signal input to DMA.

4. Setup the DMA (These steps will be different if you use a different DMA)

    a. From the Server List screen, select "**N7700:Mediabolic Server**" as the server.
    b. Go to **My Media**
    c. Click on the **Up / Down Arrow** buttons to select **Music Jukebox**, **Photo Albums**, or **Video Clips**
    d. Start enjoying the contents stored in your N7700.

## *Printer Server*

You can configure the N7700 to act as a printer server. That way, all PCs connected to the network can utilize the same printer.

### Windows XP SP2

To set up the Printer Server in Windows XP SP2, follow the steps below:

1. Connect the USB printer to one of the USB ports (preferably the rear USB ports; front USB ports can be used for external HDD enclosures).

2. Go to ***Start*** > ***Printers and Faxes***.

3. Click on **File** > **Add Printer**.

4. The **Add Printer Wizard** appears on your screen. Click ***Next***.

5. Select the "***A network printer, or a printer attached to another computer***" option.

6. Select "***Connect to a printer on the Internet or on a home or office network***", and enter "**`http://N7700_IP_ADDRESS:631/printers/usb-printer`**" into the URL field.

7. Your Windows system will ask you to install drivers for your printer. Select correct driver for your printer.

8. Your Windows system will ask you if you want to set this printer as "Default Printer". Select ***Yes*** and all your print jobs will be submitted to this printer by default. Click ***Next***.

9. Click ***Finish***.

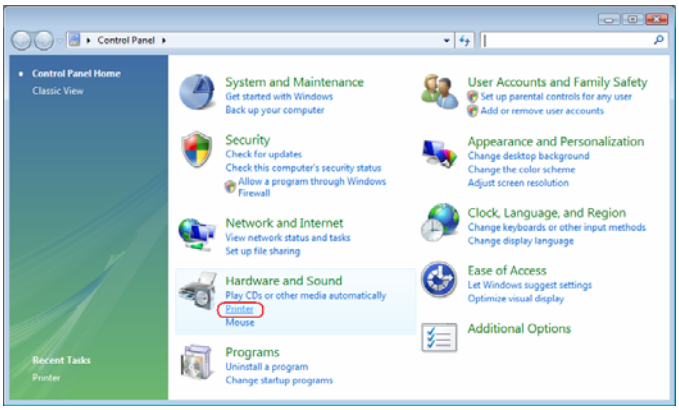
**NOTE**

- Not all USB printers are supported. Please check Thecus website for a list of supported printers.
- Note that if a multi-function (all-in-one) printer is attached to the N7700, usually only the printing and fax functions will work. Other features, such as scanning, will probably not function.

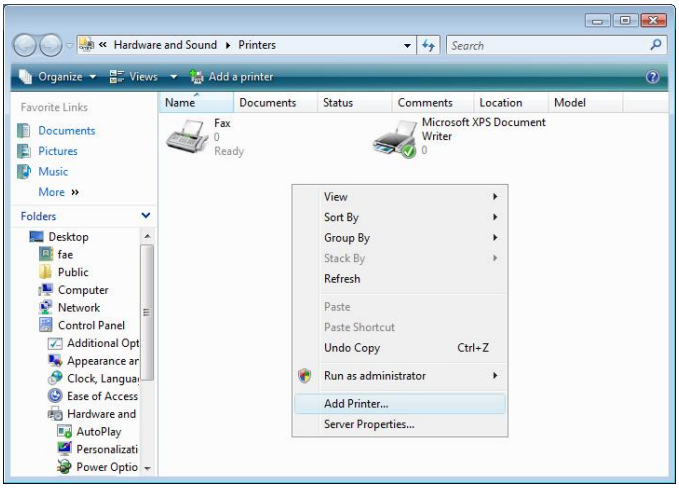
## Windows Vista

To set up the Printer Server in Windows Vista, follow the steps below:

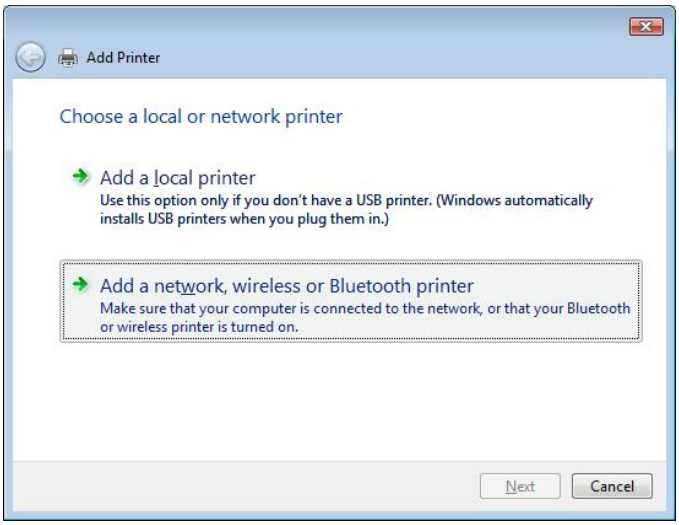
1. Open ***Printer Folder*** from the **Control Panel**.



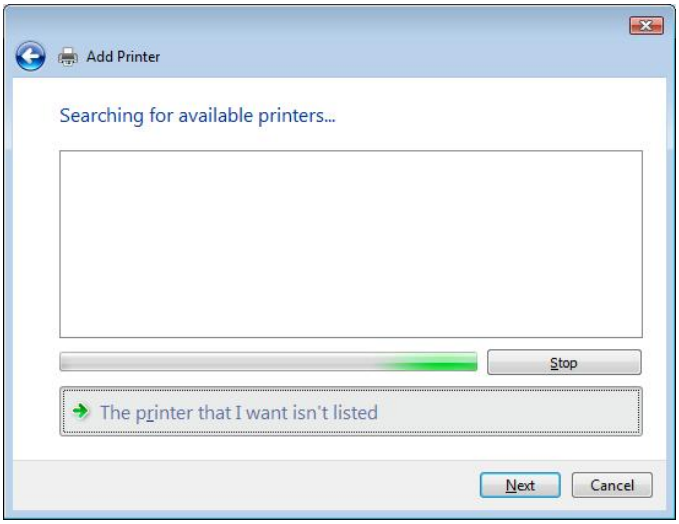

2. Click the right mouse button in anywhere on the **Printers** folder and then select ***Add Printer***.




3. Select ***Add a network, wireless or Bluetooth printer***.

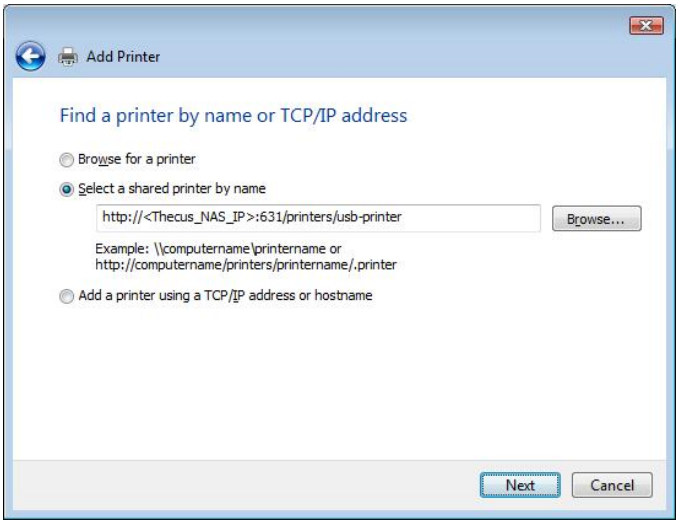

Add Printer
Choose a local or network printer
Add a local printer
Use this option only if you don't have a USB printer. (Windows automatically installs USB printers when you plug them in.)
Add a network, wireless or Bluetooth printer
Make sure that your computer is connected to the network, or that your Bluetooth or wireless printer is turned on.
Next
Cancel

4. Select ***The printer that I want isn't listed***.



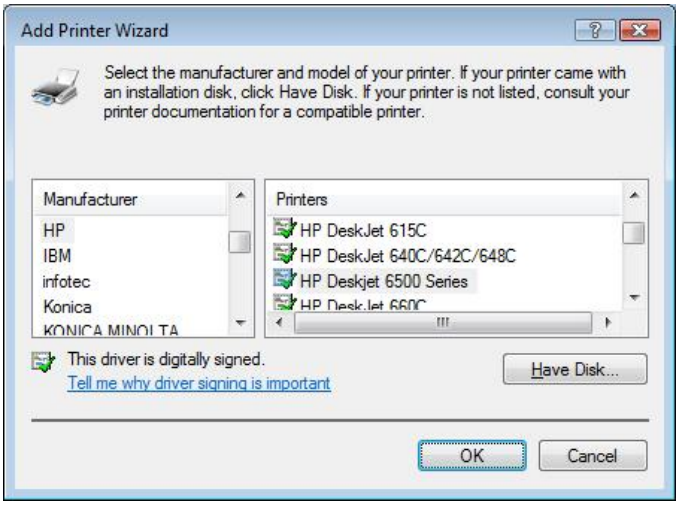

You can press ***The printer that I want isn't listed*** to go into next page without waiting for **Searching for available printers** to finish.

5. Click ***Select a shared printer by name***.



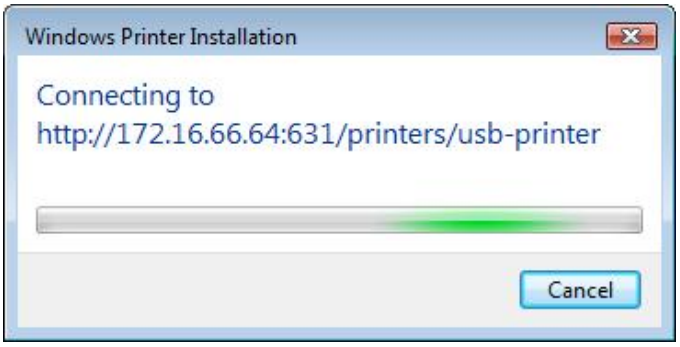

Type `http://<Thecus_NAS>:631/printers/usb-printer` in the box, where <Thecus_NAS_IP> is the IP address of the N7700. Click ***Next***.

6. Select or install a printer and then press ***OK***.

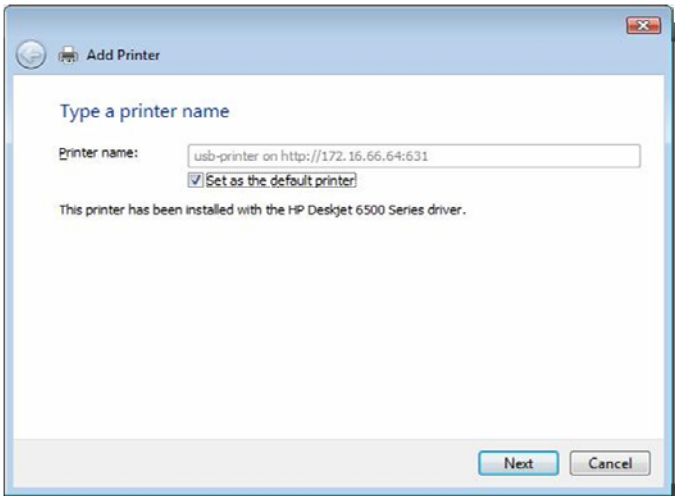

Add Printer Wizard
Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.
Manufacturer
HP
IBM
infotec
Konica
KONICA MINOLTA
Printers
HP DeskJet 615C
HP DeskJet 640C/642C/648C
HP Deskjet 6500 Series
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
OK
Cancel

If your printer model is not listed, please contact your printer manufacturer for help.

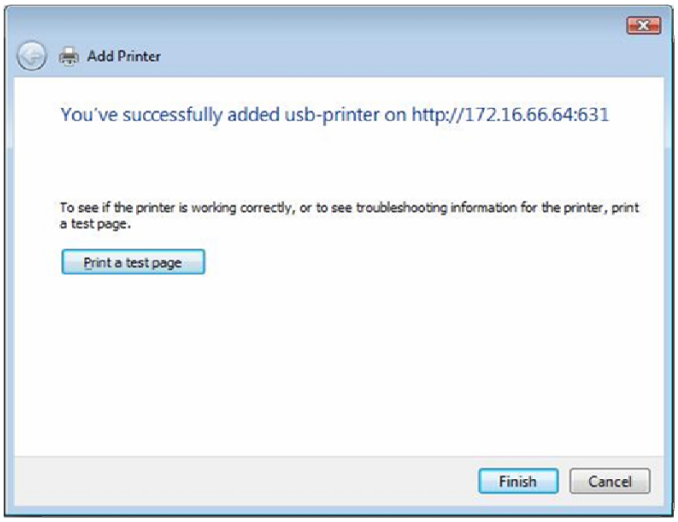
7. Windows will attempt to connect to the printer.




8. You can choose to set this printer as the default printer by checking the ***Set as the default printer*** box. Click ***Next*** to continue.

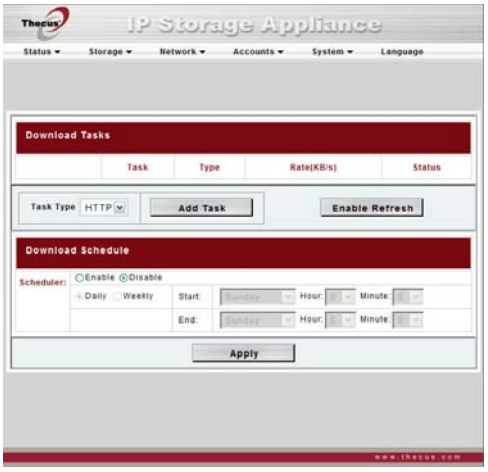



9. Done! Click ***Finish***.


Add Printer
You've successfully added usb-printer on http://172.16.66.64:631
To see if the printer is working correctly, or to see troubleshooting information for the printer, print a test page.
Print a test page
Finish
Cancel

## *Download Manager*

With the built-in Download Manager, you can have the N7700 download HTTP, FTP, and BT files without having full PC powered on. What's more, you can even schedule your downloads for off-peak hours, ensuring efficient use of bandwidth. To access the Download Manager, go to **Network**, choose the ***Download Manager*** option, and the **Download Tasks** and **Download Schedule** windows appear.



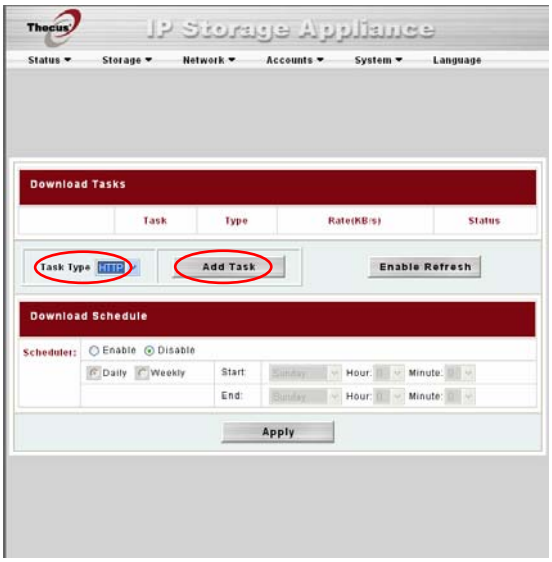

| Download Tasks | |
|---|---|
| **Item** | **Description** |
| ▶ | Click to start the specified task. |

| | |
|---|---|
| | Click to pause the specified task. |
| | Click to delete the specified task. A prompt will appear asking you if you would like to delete the task itself, or the task and all related downloaded files. |
| Task | Name of the task. Click to see more information about this task. |
| Type | Type of transfer. Can be **HTTP**, **FTP**, or **BT**. |
| Rate | Transfer rate of the task in kilobytes per second (KB/s).<br>**DL:** Download rate<br>**UL:** Upload rate |
| Status | Status of the task.<br>**Complete:** Percentage complete (%)<br>**Completed / Total download size** |
| Task Type | Use this dropdown to select the type of transfer. **HTTP**, **FTP**, and **BT** are available. |
| Add Task | Click to add the kind of task specified beside "**Task Type**". |
| Enable Refresh | Click to refresh the task list. |

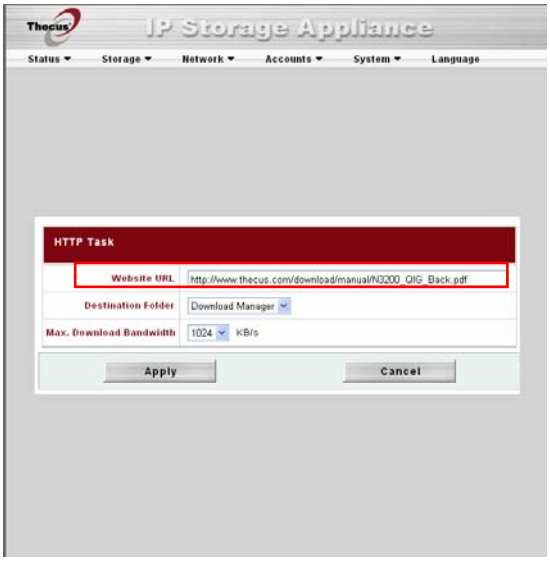
## Adding an HTTP Task

To add a new HTTP task to the Download Manager, follow these steps:

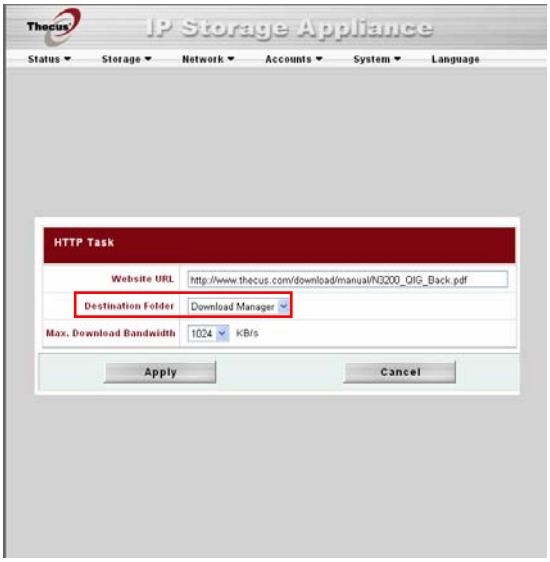
1. Using the **Task Type** dropdown, select ***HTTP*** and click ***Add Task***.



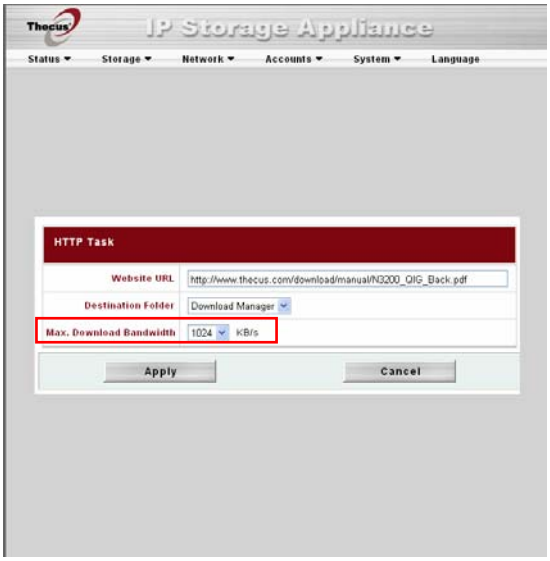

2. In the **HTTP Task** window, start by inputting the target URL in the **Website URL** box. This is the link to the download you want to queue.




3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.

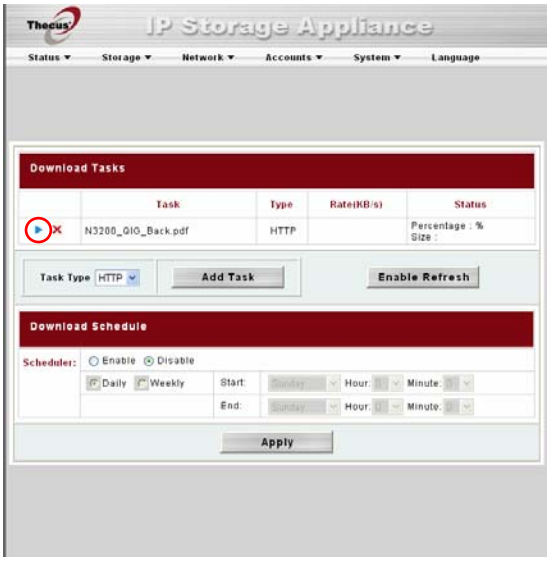



4. Select the maximum download bandwidth from the **Max. Download Bandwidth** dropdown.

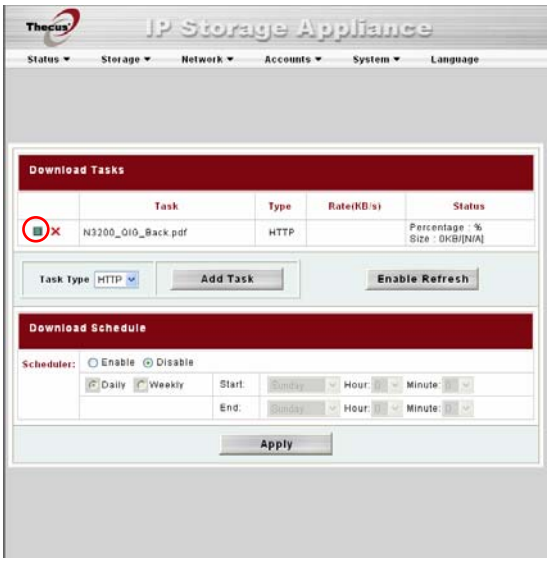



5. Press ***Apply*** to add the task.

6. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon ( ) and the download will begin.



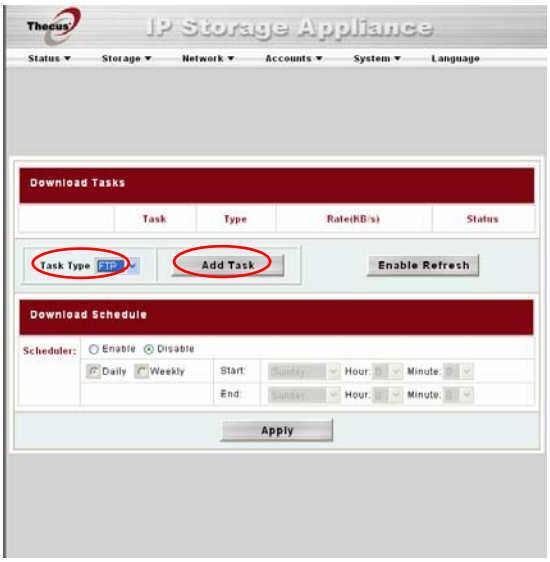

7. The download status will continually update in the **Download Tasks** window. To pause the download, click the **Pause** icon ( ).



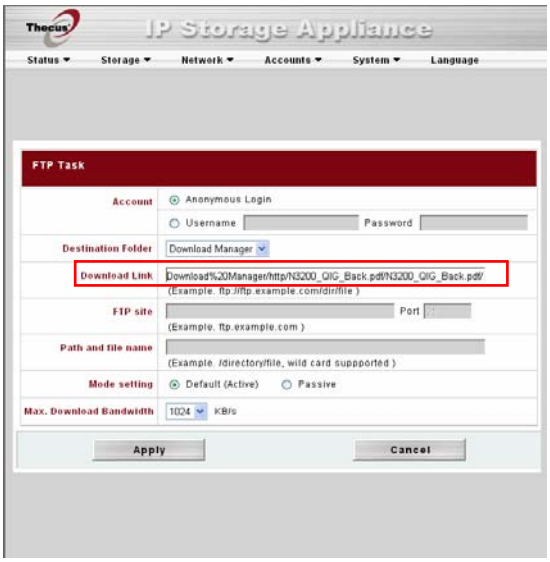
## Adding an FTP Task

To add a new FTP task to the Download Manager, follow these steps:

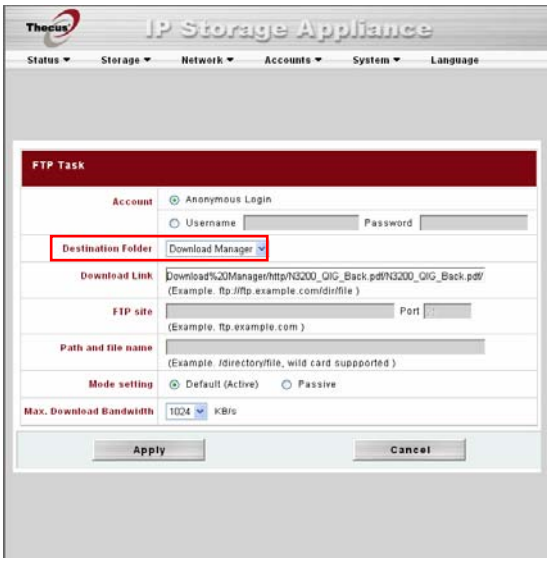
1. Using the **Task Type** dropdown, select ***FTP*** and click ***Add Task***.



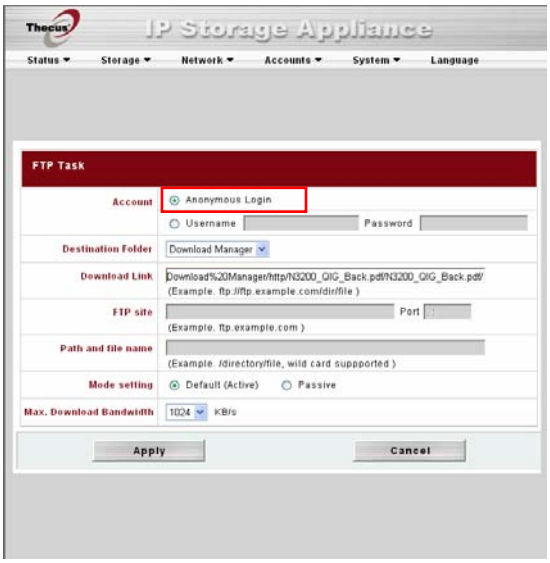

2. In the **FTP Task** window, start by inputting the target URL in the **FTP File** box. This is the link to the download you want to queue.



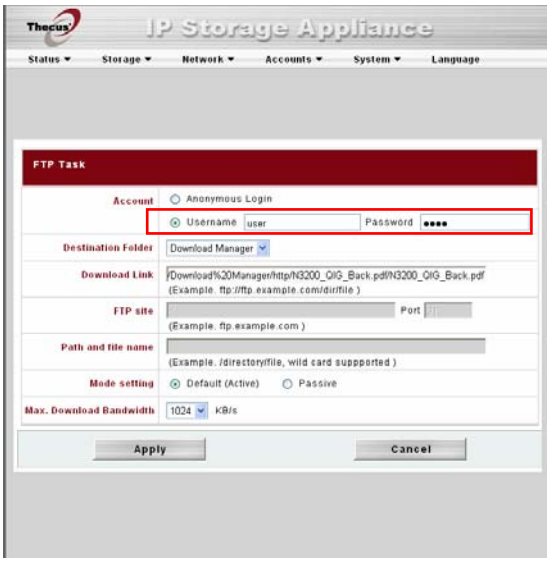
3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.



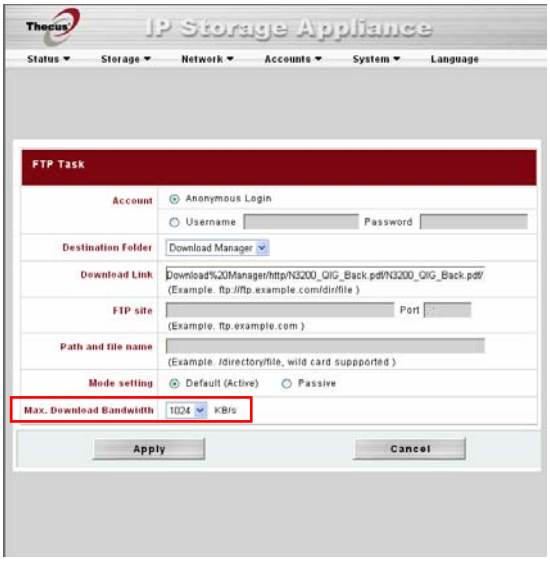

4. The next step depends if you are using an anonymous login for your FTP download. If you are logging in anonymously, select ***Anonymous Login*** and move on to step 5.



If you are required to login with a user name and password, select ***Username*** and input your user name and password into the appropriate fields.

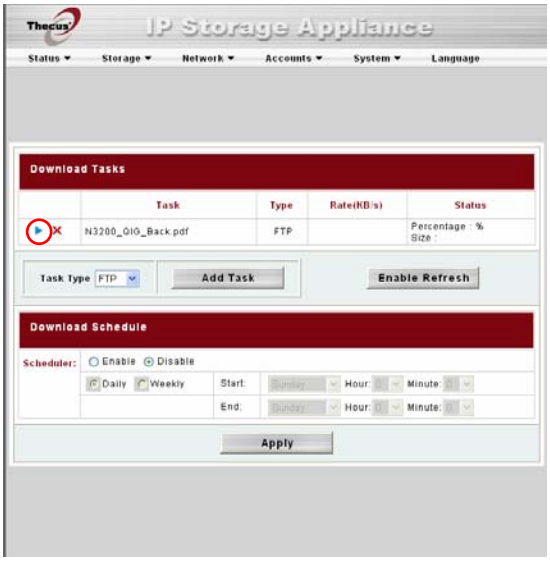



5. Select the maximum download bandwidth from the **Max. Download Bandwidth** dropdown.

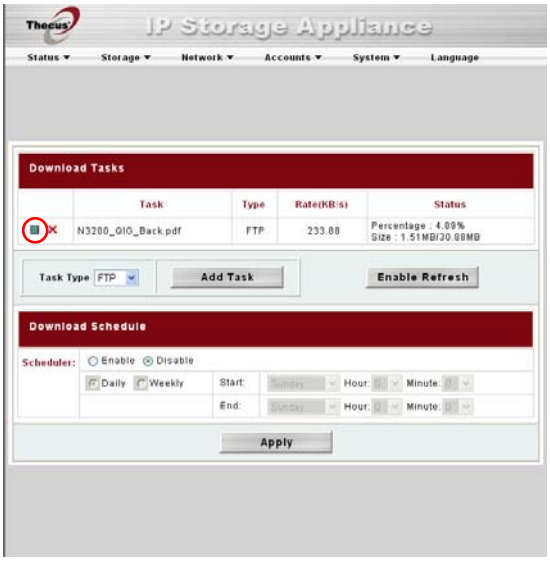



6. Press ***Apply*** to add the task.

7. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon (▶) and the download will begin.



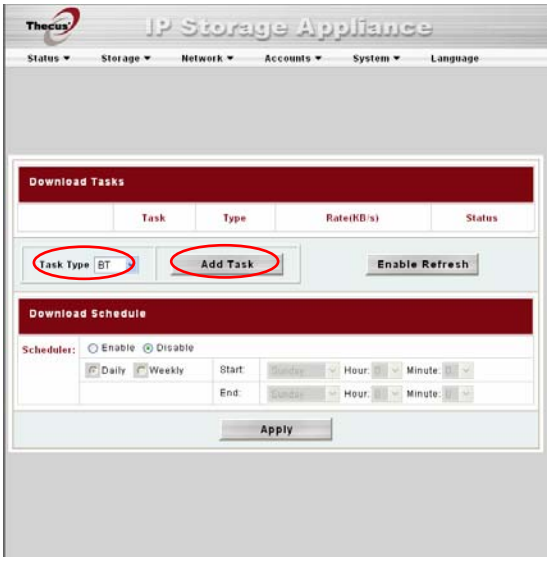

8. The download status will continually update in the **Download Tasks** window. To pause the download, click the **Pause** icon (⏸).



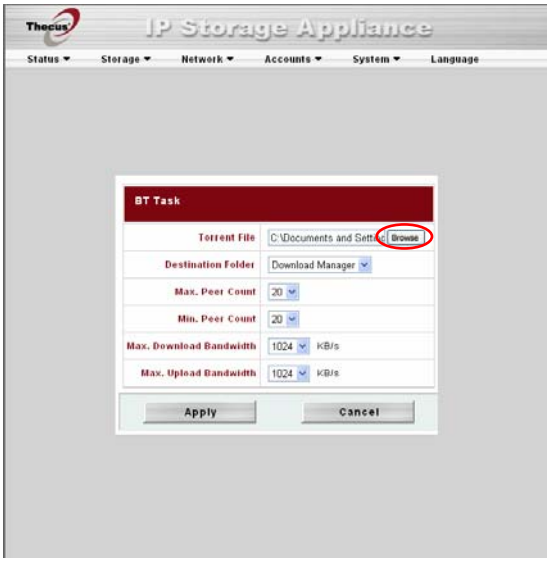

## Adding a BT Task

To add a new BT task to the Download Manager, follow these steps:

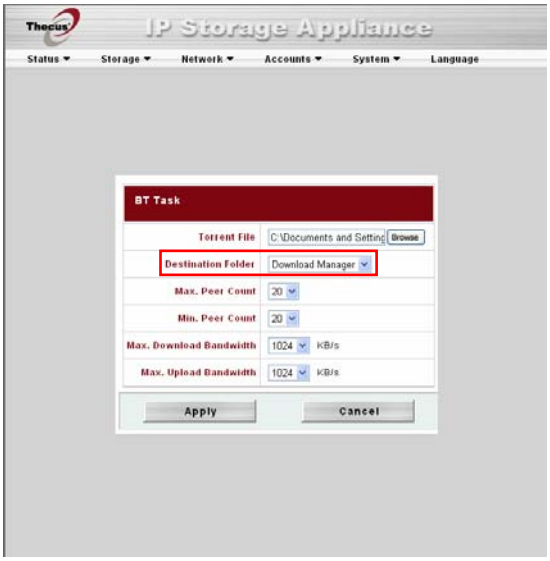
1. Using the **Task Type** dropdown, select ***BT*** and click ***Add Task***.



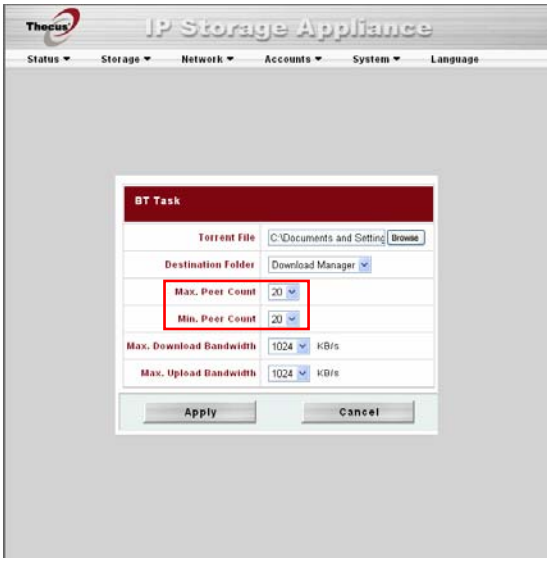

2. In the **BT Task** window, start by clicking ***Browse…*** and selecting the torrent file you wish to start.



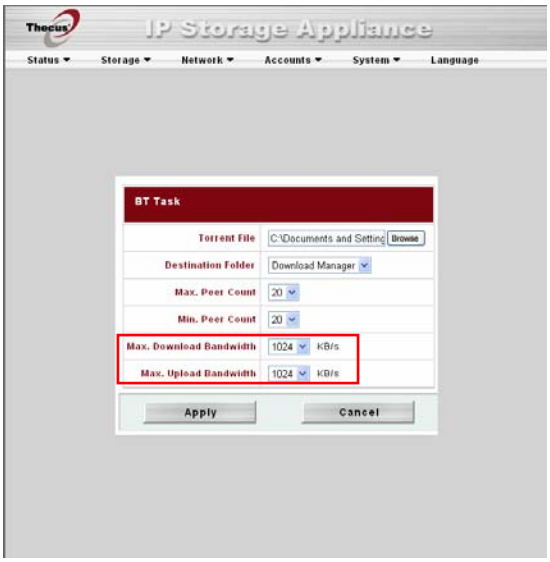

3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.




4. Next, you can select the maximum and minimum number of peers from selecting the counts from the appropriate dropdowns.

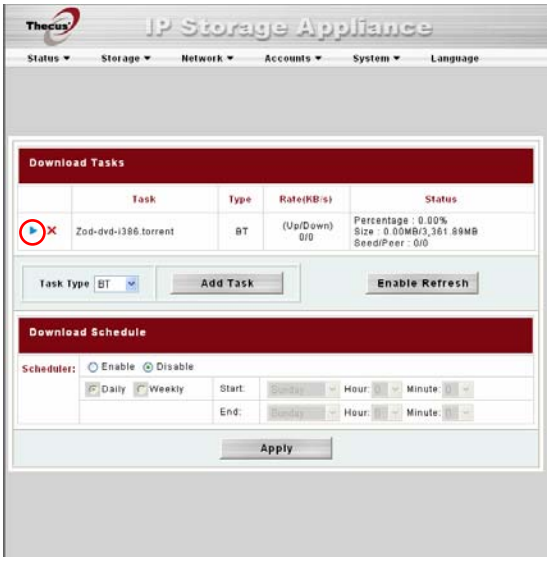


5. Next, you can set the maximum download and upload bandwidths from the dropdowns below.

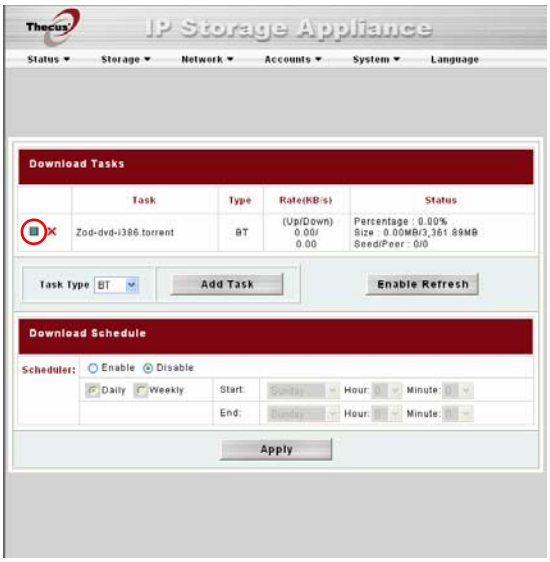



6. Press ***Apply*** to add the task.

7. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon (▶) and the download will begin.



8. The download status will continually update in the Download Tasks window. To pause the download, click the **Pause** icon ( ).




## Deleting Tasks

To delete a task, simply follow the steps below:

1. Click the delete icon ( ) beside the task that you wish to delete. The **Delete Task** dialogue box will appear.

2. Select ***Delete Task only*** if you wish to remove only the torrent file and all transient files, leaving the unfinished download files intact.

3. Select ***Delete Task and Files*** if you wish to remove the torrent file and all transient files, and the unfinished download files.
4. Click ***OK*** to delete the task. Click ***Cancel*** to return to the **Download Manager**.

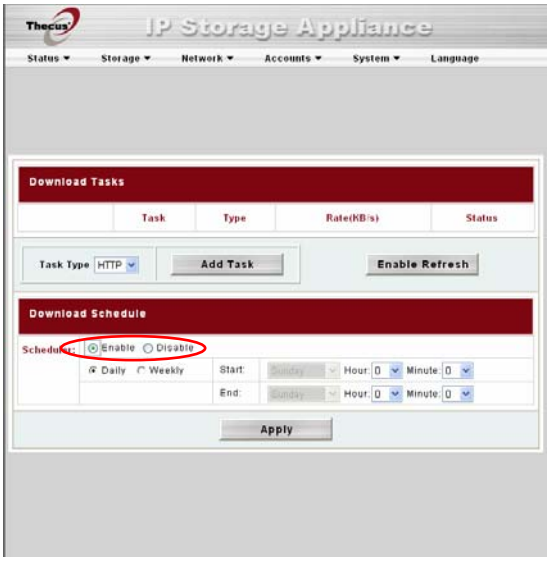
## Scheduling Downloads

With the Download Manager, you can schedule your downloads to begin at different times of the day. This is useful if you wish to complete your downloads during off-peak hours, reserving your bandwidth for other applications. A table describing the Download Schedule window appears below:

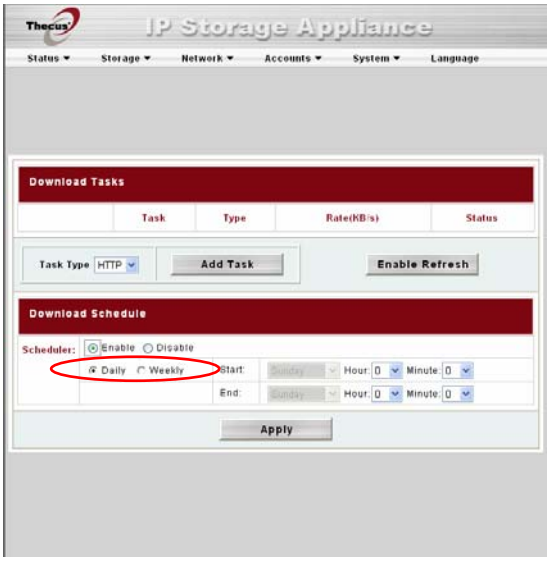
| Download Schedule | |
|---|---|
| **Item** | **Description** |
| Scheduler | Enable or disable the Download Scheduler. |
| Daily/Weekly | Choose to have the Download Scheduler activate on a daily or weekly basis. |
| Start: Day/Hour /Minute | Specify the start day/hour/minute for the download task. |
| End: Day/Hour/Minute | Specify the end day/hour/minute for the download task. |

To schedule downloads, follow these steps:

1. Under **Download Schedule**, set **Scheduler** to ***Enable***.




2. To schedule a daily download period, select ***Daily*** and select a start time and end time.
   To schedule a weekly download period, select ***Weekly*** and select a start day/time and end time/day.




3. Click ***Apply*** to save your changes.

**NOTE** If the Download Scheduler is enabled, ALL download tasks will adhere to the designated schedule.

# Chapter 6: Using the N7700

## *Overview*

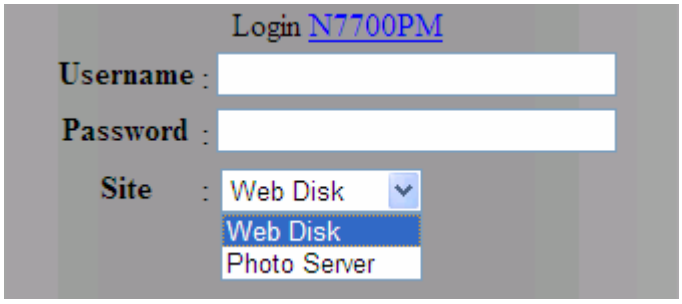
Once the N7700 is setup and operating, users on the network may manage all varieties of digital music, photos, or files by simply using their web browsers. To manage your personal files or access public files on the N7700, just enter its IP address into your browser (default IP address is `http://192.168.1.100`), and you will be taken to the **N7700 Login** page.

**NOTE**

Before proceeding, make sure that WebDisk Support or Secure WebDisk Support is enabled in the Service Support screen in the system's **Network** menu. See Service Support in Chapter 4: System Management > Network Management > Web Services Configuration.

## *Login Page*

To login to the system, enter your user name and password, and select Web Disk or Photo server then click ***Login*** to log into the system. You will be taken to the **selected** interface.




## *Using WebDisk*

The N7700 provides a WebDisk function that allows you to access the system over the Internet from any browser.

1. In the Login page, type in the User ID and password that were previously set for you in the Accounts menu. See **Chapter 4: System Management > User and Group Management > Local User Configuration**.

2. The WebDisk page appears showing folders made currently available to you via the **Access Control List (ACL)**.

3. Click on a folder name to enter the folder.

4. The folder's page appears displaying files and folders. Click on a file to download the file.

| **Folder Page** | |
|---|---|
| **Item** | **Description** |
| Name | Displays the names of folders and files. |
| Size | Shows the size of folders and files. |
| Type | Displays the type of folders and files. |
| Modified Date | Shows the time of most recent modification of folders and files. |

5. Buttons on the folder page allow you to create a new folder, upload files and delete files in the folder.

| Folder Page Buttons | |
|---|---|
| **Button** | **Description** |
| Up | Goes to the previous folder level. |
| New folder | Creates a new folder. |
| New file (upload) | Uploads a file from your computer to the current folder. |
| Delete Selected Items | Deletes selected files and folders. |

6. To create a new folder within the current folder, press the New folder button. When the screen appears enter a name for the folder. Press OK to create the folder.

7. To upload a file from your computer to the current folder, press the New file (upload) button. When the screen appears, press Browse and locate the file to upload. Press **OK** and the file is uploaded to the current folder.

8. To delete a file or folder, select the file or folder's check box. Press the Delete selected items button. You can also check the check box as the red circle indicates to select all files and folders in this folder.

To access folders with access control, you must first login with a local user account.

For more information on how to setup user rights to the folders, please check ***Chapter 4: System Management > Folder Management > Folder Access Control List (ACL)***.

## *Photo Server*

Using the Photo Server, users can view and share photos, and even create their own albums right on the N7700.

You will see your own Photo Gallery and all public Photo Albums on the network.

To manage any picture files, you must first select the item by clicking the box.

### Windows XP Publishing Wizard

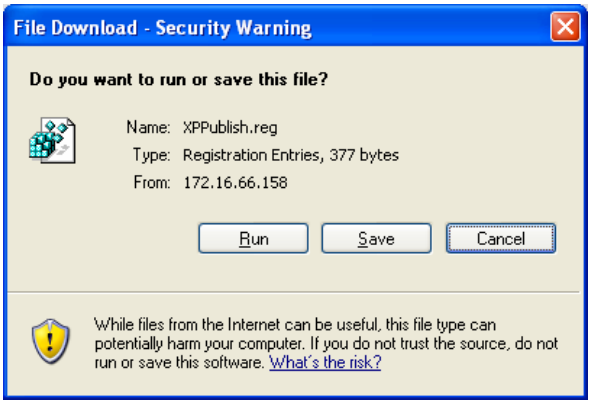
There are many ways for a local user to upload pictures into their photo album. Users of Windows XP can upload their pictures using the Windows XP Publishing Wizard.

1. Click on the ***XP Publishing Wizard*** icon on top right corner.

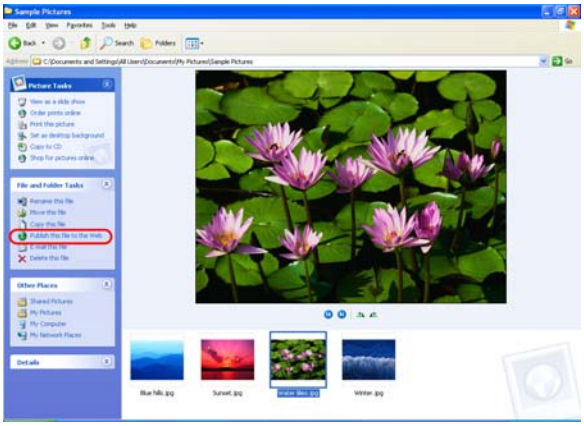
2. The **XP Web Publishing Wizard Client** screen appears. Click on the link to install the Publishing Wizard.

IP Storage Server
XP Web Publishing Wizard Client
This function allows to use Windows XP web publishing wizard with N4100PRO.
What is required
Windows XP in order to have the wizard.
How to install on client side
Right click on this link. Select "save target as..". Save the file on your hard drive. When saving the file, check that the proposed file name is XPPublish.reg. When downloaded, double click on the file in order to register your server with the web publishing wizard.
How to publish
In Windows Explorer, select some files and click on Publish xxx on the web in the left pane.
When it is completed, check your gallery to see if pictures have been properly added.
Protect Your Source Secure Your Data
www.thecus.com

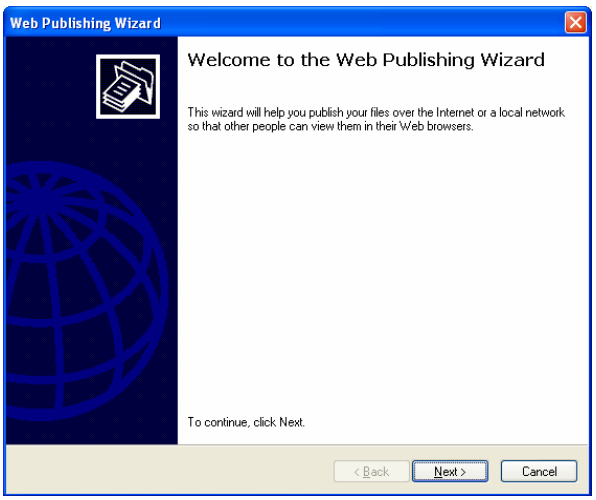
3. Windows XP will ask whether you want to run or save this file. Click Save to save the register file. .


File Download - Security Warning
Do you want to run or save this file?
Name: XPPublish.reg
Type: Registration Entries, 377 bytes
From: 172.16.66.158
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?

4. Once the register file is installed, use the Windows file manager to browse the folder that contains the picture you want to publish. On the left pane, there will be an icon labeled "**Publish this folder to the Web**".



5. Click on this icon and **Web Publishing Wizard** will start.

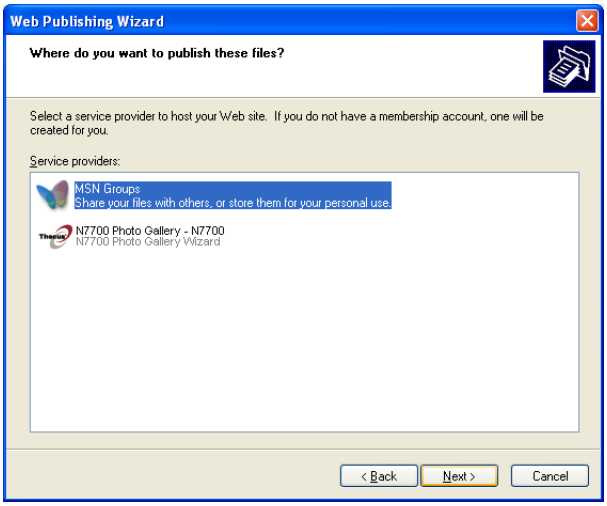

Web Publishing Wizard
Welcome to the Web Publishing Wizard
This wizard will help you publish your files over the Internet or a local network so that other people can view them in their Web browsers.
To continue, click Next.
< Back
Next >
Cancel

6. Select the pictures you want to publish to the Photo Web Server by placing a check mark on the top left hand corner of the picture. Click ***Next***.

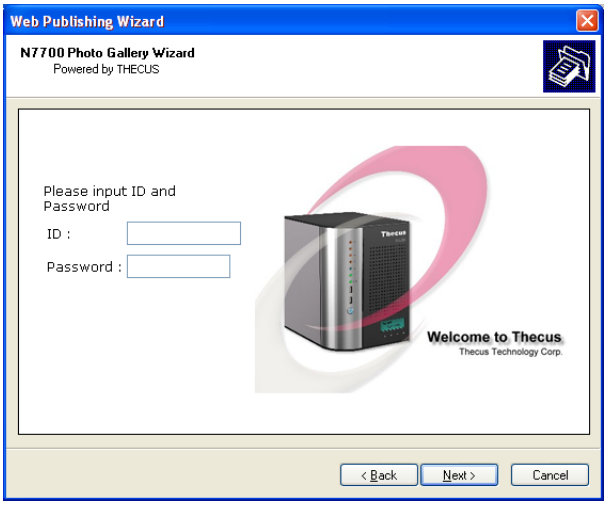
Web Publishing Wizard
Change Your File Selection
You can publish the files that have check marks. If you do not want to publish a file, clear its check box.
50 files selected of 50
Select All
Clear All
< Back
Next >
Cancel

7. Your PC will start to connect to the Photo Web Server.

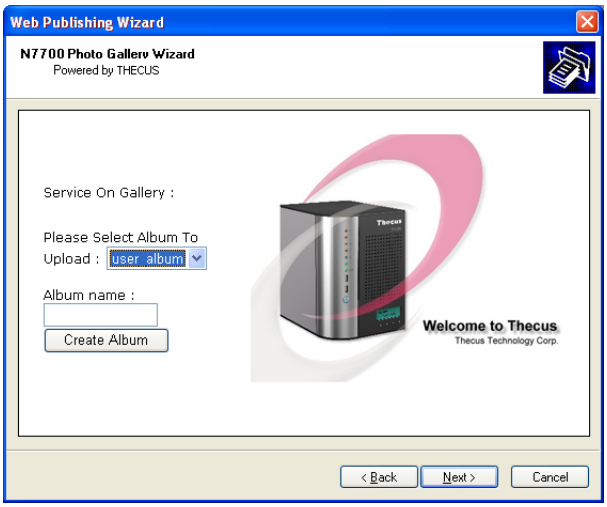
8. Select **N7700 Photo Gallery Wizard** to publish your pictures to the N7700.


Web Publishing Wizard
Where do you want to publish these files?
Select a service provider to host your Web site. If you do not have a membership account, one will be created for you.
Service providers:
MSN Groups
Share your files with others, or store them for your personal use.
N7700 Photo Gallery - N7700
N7700 Photo Gallery Wizard
< Back
Next >
Cancel

9. Login into the N7700 with your local user name and password.

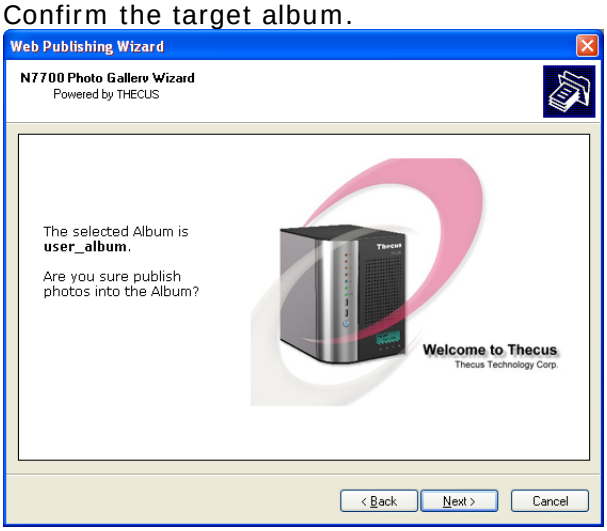



10. Create your album by entering an album name and clicking on the **Create Album** button.

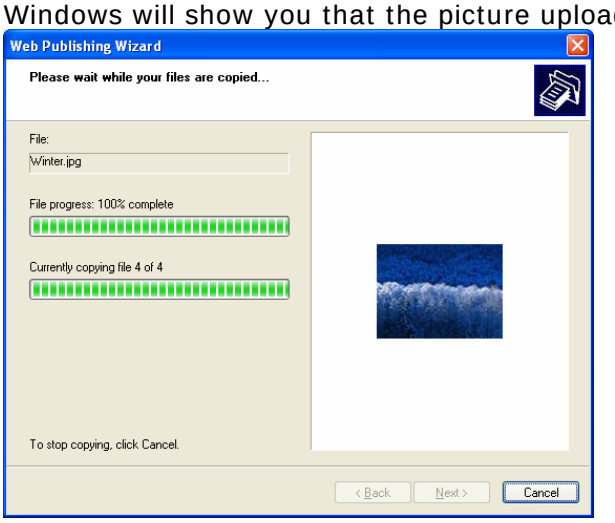



11. Select the album you want to upload your pictures to.

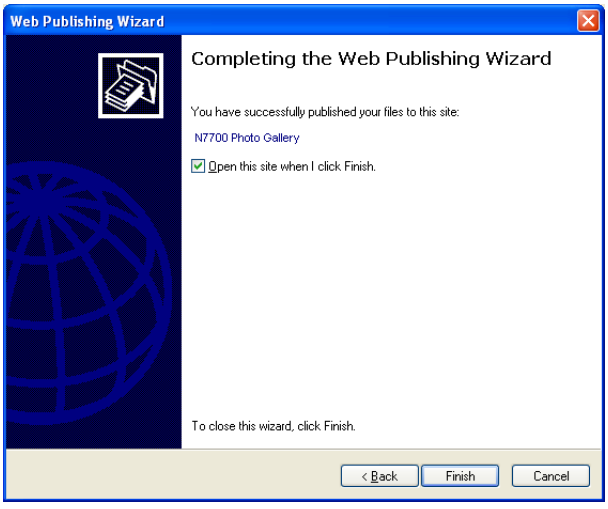
12. Confirm the target album.




13. Windows will show you that the picture upload is in progress.




14. When the upload is finished, the Wizard will ask you whether if you want to go to the website. Click ***Finish*** to go to your Photo Web Server.


Web Publishing Wizard
Completing the Web Publishing Wizard
You have successfully published your files to this site:
N7700 Photo Gallery
Open this site when I click Finish.
To close this wizard, click Finish.
< Back
Finish
Cancel

15. Click on the user's icon to go to that user's album.

16. You will see the user's album list. Click on **Album**.

17. Finished! You will see the pictures just selected in the album.

## Managing Albums and Photos

| Photo | | |
|---|---|---|
| **Icon** | **Function** | **Description** |
| | Make Cover | Make selected photo your cover picture. |
| | Back | Return to the previous screen. |
| | Add | Add a new album or photos. |
| | Modify | Edit the name and description of the selected album or photo. Each name is limited to 20 characters and each description is limited to 255 characters. |
| | Delete | Delete the selected albums or photos. |

**NOTE**

- Only logged in users will see these icons.
- To prevent system errors, the N7700 sets the following limitations on photo files:
  - Each file upload is limited to a size of 8MB. Files exceeding 8MB will NOT be uploaded and no error message will appear.
  - Only these photo file types will be uploaded: *.jpg, *.gif, *.bmp, *.png, *.pcx, *.psd, *.bmp.
  - If duplicate file names exist during upload process, system will add a number in front of the original file name (abc → 1abc).

## Creating Albums

To create a photo album, follow the steps below:

1. Click the ***Add*** button to create a new album.
2. Enter a name for the album, and enter a description if you wish. Then, click on the ***Create Album*** button.

## Password Protecting Albums

If you would like to put a password on a particular album, follow these steps:

1. Select the album to be protected, click on the ***Edit*** button, and the **Album Edit** screen will appear.

2. The owner of the album can enter an album password to protect the album, so that only people with the correct password can view the album.

## Uploading Pictures to Albums

Uploading pictures to albums using the Web User Interface is easy:

1. When the album is created, click the album icon to enter the album. Initially the album is empty.

2. Click the ***Add*** button to upload pictures into the album. The **Upload Photos** screen will appear. Users can select and upload up to 8 pictures at a time.

3. Once the picture is uploaded, you can view it in the album. The owner of the album can delete or modify the pictures with the ***Delete*** or ***Modify*** buttons on the top right hand corner

## EXIF Information

While viewing pictures, you can also have the N7700 display the EXIF information for each photo.

Simply click the ***EXIF*** button to display EXIF information. To hide this information, click the ***EXIF*** button again.

## Slide Shows

Slide shows are a great way to enjoy pictures stored on your N7700.

You can click on the ***Start Slide Show*** icon on the top right hand corner to start the slide show.

To stop the slide show, click on the ***Stop Slide Show*** icon on the top right hand corner.

## *Mapping a Client PC to the N7700*

You can map share folders on the N7700 so that you can access them as if they were drives on your computer. You can connect to the shared network folders on the N7700 as follows:

### Windows

1. Go to the **My Computer** folder in Windows.
2. In the menu bar, select ***Tools*** and then ***Map Network Drive…***
3. The **Map Network Drive** window appears.
4. Assign a drive letter for the share folder.
5. Click the ***Browse*** button to find the folder over your network. Alternatively, you may enter the folder name you wish to connect to or enter its IP address. (i.e. `\\192.168.1.100\share`)
6. Click ***Finish***. When the **Connect As…** window appears, enter your user name and password.
7. Click ***OK***. The share folder appears as the drive you assigned. You can now access this folder as though it were a drive on your computer.

### Apple OS X

On an Apple computer, you can connect to shared computers and servers using a network address.

1. Choose ***Go*** > ***Connect to Server…***
2. Enter the network address for the server in the Server Address text box.

When connecting using SMB/CIFS protocol, type:
`smb://192.168.1.100/Folder1`
When connecting using AFP protocol, type:
`afp://192.168.1.100/Folder1`
Click ***Connect***.

3. When MAC OS X is trying to connect N7700, it will ask for a User Name and Password which has access to the folder.

4. When MAC OS X has connected to the N7700 successfully, an icon representing the folder will appear on the MAC OS X desktop. You can access the folder by double clicking on the icon.

## *Mapping the N7700 as an iSCSI Drive*

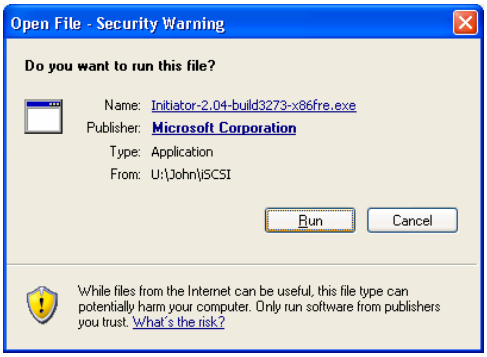
With the N7700, you are able to map it as an iSCSI drive. With iSCSI, you can remotely access the N7700 at great speeds, as if it were installed as a local drive in your computer.

To do this, simply follow the steps below:

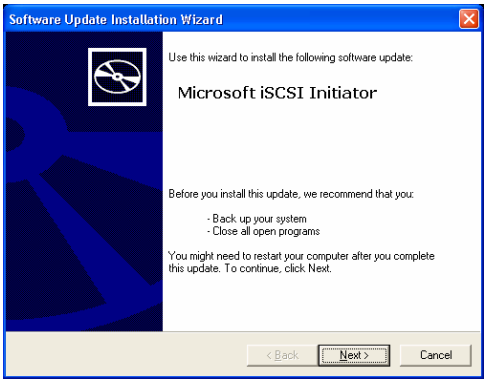
### Windows 2000/XP

1. First, download the iSCSI Initiator from the Microsoft website (http://www.microsoft.com). You can find this software by entering `iSCSI Initiator` into the search box on their homepage.

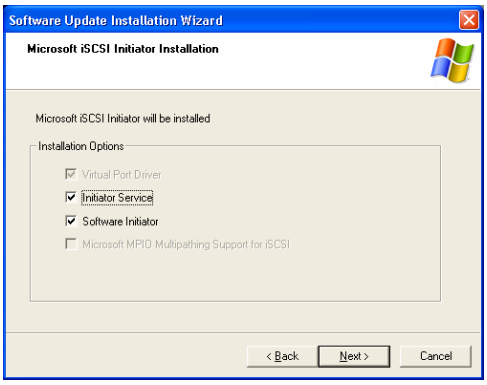
2. Once the download is complete, install the iSCSI Initiator by double-clicking the EXE file. You may be presented with the following security warning. Click ***Run*** to continue.


Open File - Security Warning
Do you want to run this file?
Name: Initiator-2.04-build3273-x86fre.exe
Publisher: Microsoft Corporation
Type: Application
From: U:\John\iSCSI
Run
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?

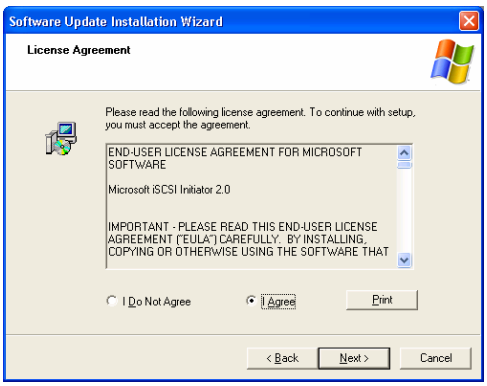
3. You will now install the iSCSI Initiator using the Setup Wizard. Click ***Next*** to continue.


Software Update Installation Wizard
Use this wizard to install the following software update:
Microsoft iSCSI Initiator
Before you install this update, we recommend that you:
- Back up your system
- Close all open programs
You might need to restart your computer after you complete this update. To continue, click Next.
< Back
Next >
Cancel

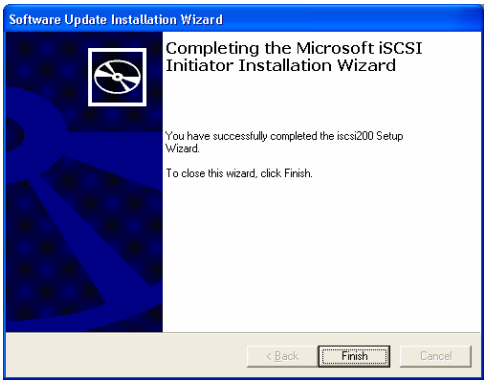
4. Leave the default selections and click ***Next***.




5. Read the license agreement. To continue with the installation, click ***I Agree*** and then click ***Next***.

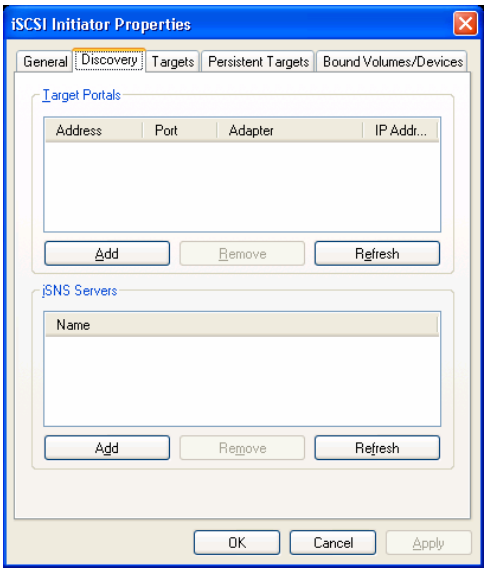

Software Update Installation Wizard
License Agreement
Please read the following license agreement. To continue with setup, you must accept the agreement.
END-USER LICENSE AGREEMENT FOR MICROSOFT SOFTWARE
Microsoft iSCSI Initiator 2.0
IMPORTANT - PLEASE READ THIS END-USER LICENSE AGREEMENT ("EULA") CAREFULLY. BY INSTALLING, COPYING OR OTHERWISE USING THE SOFTWARE THAT
I Do Not Agree
I Agree
Print
< Back
Next >
Cancel

6. The iSCSI Initiator will now install automatically. Click ***Finish*** once completed.

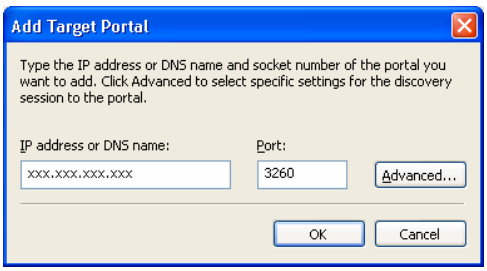

Software Update Installation Wizard
Completing the Microsoft iSCSI Initiator Installation Wizard
You have successfully completed the iscsi200 Setup Wizard.
To close this wizard, click Finish.
< Back
Finish
Cancel

7. Start the iSCSI Initiator by double-clicking its icon on the desktop. The iSCSI Initiator properties window will appear.

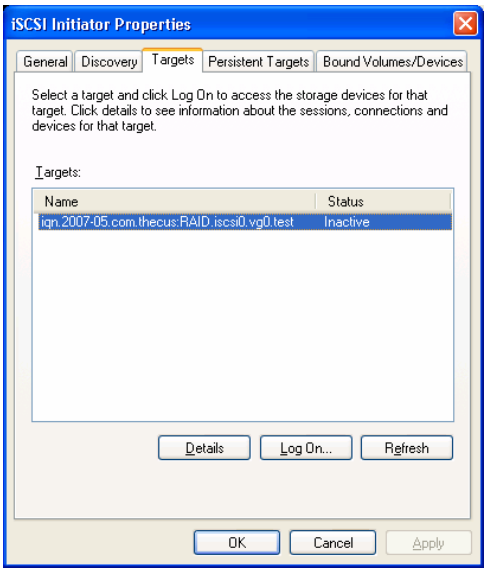
8. Select the ***Discovery*** tab. Under **Target Portals**, click ***Add***.



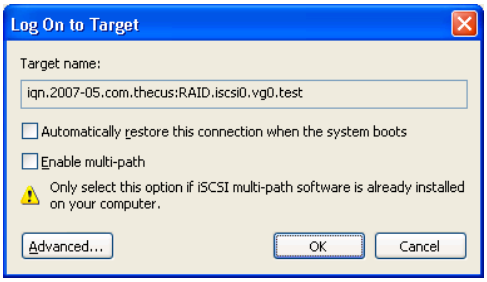

9. Enter the IP address of the N7700. Click ***OK***.


Add Target Portal
Type the IP address or DNS name and socket number of the portal you want to add. Click Advanced to select specific settings for the discovery session to the portal.
IP address or DNS name:
Port:
xxx.xxx.xxx.xxx
3260
Advanced...
OK
Cancel

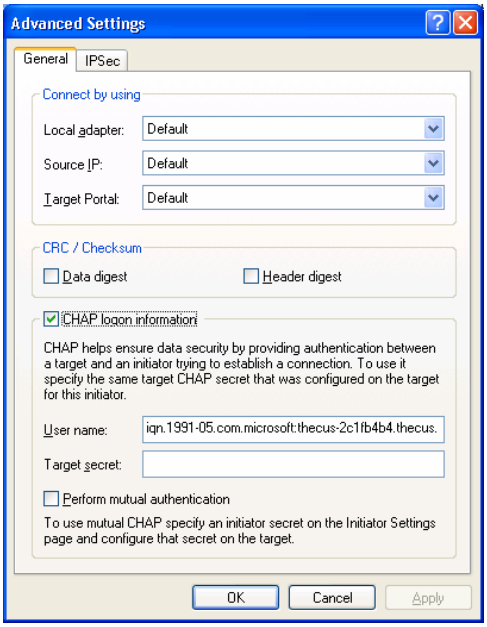
10. On the **iSCSI Initiator Properties** window, select the ***Targets*** tab. With the iSCSI target highlighted, click ***Log On***. The **Log On to Target** dialogue will appear.



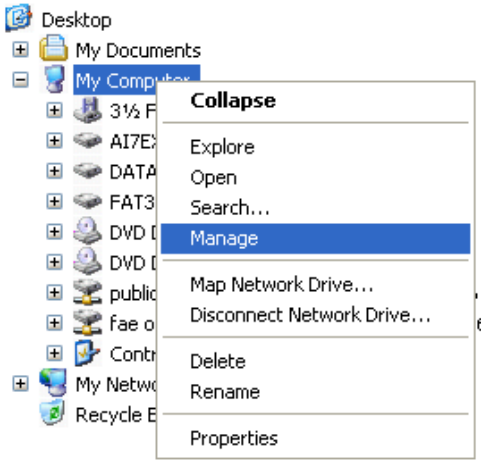

11. If you have not enabled CHAP, click ***OK*** to continue.



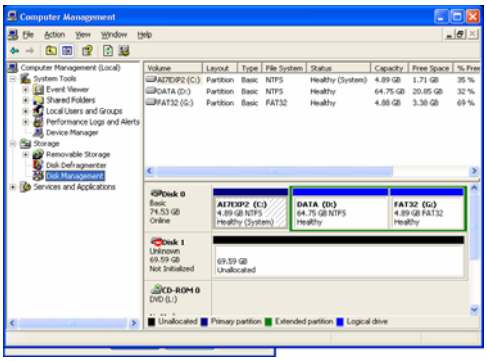

If you have enabled CHAP, click ***Advanced***. Under Advanced Settings, check the **CHAP login information** checkbox and enter your username and password. Click ***OK***.


Advanced Settings
General
IPSec
Connect by using
Local adapter:
Default
Source IP:
Default
Target Portal:
Default
CRC / Checksum
Data digest
Header digest
CHAP logon information
CHAP helps ensure data security by providing authentication between a target and an initiator trying to establish a connection. To use it specify the same target CHAP secret that was configured on the target for this initiator.
User name:
iqn.1991-05.com.microsoft:thecus-2c1fb4b4.thecus.
Target secret:
Perform mutual authentication
To use mutual CHAP specify an initiator secret on the Initiator Settings page and configure that secret on the target.
OK
Cancel
Apply

12. Right click ***My Computer*** on the desktop and select ***Manage***.




13. Click on Disk Management and you will see a new hard disk listed.



14. Initialize the new hard disk and you will then be able to use the iSCSI target as a local drive.

### Windows Vista

Because Windows Vista has the Microsoft iSCSI Initiator pre-installed, you will not have to install this piece of software. Instead, start the iSCSI Initiator and follow steps 8-14 to map the N7700 as an iSCSI drive.

## *File Backup*

There are a number of ways to back up data with the N7700.

### Nsync

You can backup a share folder to another N7700 (Nsync Target) or any FTP server for safe keeping as long as you have appropriate access right on that target. When using Nsync between two N7700s, you have the option to transmit files securely between two N7700s.

If the files on your N7700 are lost for any reason, you can restore those files from the target N7700. To backup files regularly, you can set up a scheduled task to run only once, daily, weekly, or monthly. You can also limit the bandwidth of your Nsync tasks, so other users on the network can share the bandwidth equally.

Under the **Storage** menu, click ***Nsync*** and the **Nsync** window appears. Below is a description of each field:

| **Nsync** | |
|---|---|
| **Item** | **Description** |
| Task name | The name of your Nsync task. |
| Server | The IP address of your target server |
| Share folder | The share folder you would want to backup. |
| Last Time | The time when the last Nsync task was executed. |
| Last Status | The status of your last Nsync task. |
| Action | Administrator can run or stop an Nsync task by pressing the action button. |
| Bandwidth Setting | Bandwidth control on Nsync tasks. |
| Add | Click to add a Nsync task |
| Modify | Click to modify an Nsync task. |
| Restore | Restore share folder from an Nsync target. |
| Delete | Click to delete an Nsync task. Backup files on Nsync target is also deleted. |

#### *Adding an Nsync Task*

From the **Nsync Information** screen, click ***Add*** to display the **Add Nsync Task** screen.

| **Add Nsync Task** | |
|---|---|
| **Item** | **Description** |
| Task Name | The name of your Nsync task. |
| Manufacturer | Select whether the target is a Thecus Product (e.g. N7700) or FTP server. |
| Target Server IP Address | The IP address of your target server. |
| Source Folder | The share folder you want to backup. |
| Nsync Task Name | The name of your Nsync task. |
| Authorized Username on Target Server | The account name on the target server. |
| Password on Target Server | The password for the username on the target server. |
| Test Connection | Click to check the connection to the Target Server. |

| | |
|---|---|
| Schedule | Schedule backup of your share folders. |
| Time | The time when the Nsync task will run. |
| Type | Select whether to run the Nsync task daily, weekly, or monthly.<br>**Daily**: input the time of day to execute Nsync task.<br>**Weekly**: input which day of the week to execute the task.<br>**Monthly**: decide which day of the month to execute the task. |
| Apply | Click to submit the task. |

**NOTE** Before starting an Nsync Task, make sure the target server's Nsync Server (or FTP Server) is enabled.

### *Setting Up an Nsync Target on an Nsync Device*

On the Nsync target server, the administrator of that server has to set up a user account with a folder named "nsync" and grant write access.

1. On the Nsync server, add a user for Nsync source (ex. nsyncsource1). For instructions on how to add a user on the N7700, see **Chapter 4: System Management > User and Groups Management > Local User Configuration > Adding Users**.

2. On the Nsync server, grant that user (ex. nsyncsource1) write access to the **nsync** folder. For instructions on how to set up a folder's ACL, see **Chapter 4: System Management > Folder Management > Folder Access Control List (ACL)**.

3. Once this is done, the target server will start accepting Nsync tasks from server using that ID and password.

### *Setting Up an Nsync Target on Another Device*

If you selected "Other Device" when setting up your Nsync task, the N7700 will use the FTP protocol to back up the share folder. On the external storage device, make sure there is a folder named "nsync", and the Auth ID has writable permission in that folder.

### *Designating N7700 as an Nsync Target*

The N7700 can act as an Nsync server, enabling another Nsync-equipped Thecus NAS at a remote location backup their files to this N7700. From the **Network** menu, choose the ***Nsync Target*** item, and the **Nsync Target Server Setting** screen appears.

| **Nsync Target Server Setting** | |
|---|---|
| **Item** | **Description** |
| Nsync Target Server | Enable or Disable Nsync Target support. |

**NOTE** To enable Nsync task to go thru firewall, you have to open port TCP/1194 on your firewall in both directions.

## Thecus Backup Utility

The Thecus Backup Utility is on your Installation CD. When you click on the CD, the Backup Utility will be installed under **Program Groups** > **Thecus** > **Thecus Backup Utility**. If it is not installed, you can copy the file (**Thecus Backup Utility.exe**) to a convenient location on your hard disk and double click to execute it.

**NOTE** If you can not find Thecus Backup Utility on your CD, please download it from the Thecus website (http://www.thecus.com).

When you execute this utility for the first time, it will ask you whether to create a DB file. Click ***Yes***.

1. Click ***Add*** to create a Backup task. The **Add New Task** dialog box appears.

| Add New Task | |
|---|---|
| **Item** | **Description** |
| Task | Specifies a name for the current task. |
| Source | Click to specify the source folder/file location. |
| Incremental | Click to specify whether the backup will be incremental. If unchecked, the backup will be a full backup. |
| Destination | Click to specify the destination folder/file location. |
| Excluded extensions | Files with these file name extensions will be skipped and not back up to the destination. |
| Comments | If you wish, enter comments here for your records. |

2. To schedule the task to run at regular intervals, click on the ***Schedule*** icon for that task. You can schedule the task to run **Monthly** or **Weekly**.

3. To check the log for that task, click on the ***Log*** icon for that task.

**NOTE** Thecus Backup Utility also supports MAC OS X. Just copy the Thecus Backup Utility.dmg to your MAC OS X machine and double click to execute it.

## Windows XP Data Backup

If you use Windows XP Professional, you can also use the Windows Backup Utility (Ntbackup.exe) to backup your files.

If you use Windows XP Home Edition, follow these steps to install the utility:

1. Insert the Windows XP CD into a drive and double-click the ***CD*** icon in **My Computer**.

2. When the Welcome to Microsoft Windows XP screen appears, click ***Perform Additional Tasks***.

3. Click ***Browse this CD***.

4. In Windows Explorer, navigate to ***ValueAdd*** > ***Msft*** > ***Ntbackup***.

5. Double-click ***Ntbackup.msi*** to install the backup utility.

Once installed, you can use the Windows Backup Utility by following the steps below:

1. Click ***Start***, and point to ***All Programs*** > ***Accessories*** > ***System Tools*** > ***Backup*** to start the wizard.

2. Click ***Next*** to skip past the opening page. Choose **Backup files and settings** from the second page, and then click ***Next***.

3. Select which option you want to back up.

4. Click ***Next*** and in the Backup Type, Destination, and Name page, specify a back up location using the ***Browse*** button.

5. Find and select the drive that specifies your N7700 as your backup destination and click ***Next***.

6. Click ***Next*** to display the wizard's final page and click ***Finish*** to start backing up.

## Apple OS X Backup Utilities

Mac OS X does not include any backup software. However, there are a number of backup solutions available for the Mac OS X, including: iBackup, Psyncx, iMSafe, Rsyncx, Folder Synchronizer X, Tri-BACKUP, Impression, Intego Personal Backup, SilverKeeper, and Apple's dotMac Backup utility to name just a few. To find even more freeware and shareware backup utilities to choose from, go to VersionTracker or MacUpdate and search on "backup".

# Chapter 7: Tips and Tricks

## *USB and eSATA Storage Expansion*

The N7700 supports external USB hard disks through its four USB ports. Once a USB hard disk has successfully mounted, the entire volume will be copied automatically to the default USB HDD folder. The N7700 supports up to 4 USB external storage devices. All file names on the USB disk volume are case sensitive.

The N7700 also supports eSATA hard disks with its eSATA port.

Before attaching an eSATA or USB disk drive to N7700, you have to partition and format it on a desktop computer or a notebook first. The attached device will be located at `\\192.168.1.100\usbhdd\sdf1` where `192.168.1.100` means the IP address of N7700 and `sdf1` stands for the first partition on disk #6, the eSATA or USB disk drive. If it is an NTFS partition, NAS users can open or copy files from `\\192.168.1.100\usbhdd\sdf1` but cannot add new files or modify existing files.

**NOTE**

If you want to write to an USB storage device, the file system must be FAT32.

| USB Storage | FAT32 Partition | NTFS Partition |
|---|---|---|
| Read | OK | OK |
| Write | OK | - |

## *Adding a Spare Disk*

With a RAID 1, RAID 5, RAID 6, or RAID 10 volume, you can add a spare disk after the initial RAID is setup. To add a spare disk, follow the steps below:

1. On the **RAID Configuration Screen**, tick the checkbox of the hard disk you wish to designate as a spare disk.

2. Click ***Add Spare***. The disk will be configured as a spare disk. The system automatically rebuilds the spare disk when one of the disks in the RAID set fails.

## *Remote Administration*

You can set up your N7700 for remote administration. With remote administration, you can access your N7700 over the Internet, even if your N7700 is behind a router. This is especially useful if you are traveling and suddenly need a file from your N7700.

Setting up remote administration is a three-part process, and will require the following equipment:

- Thecus N7700 NAS device
- Cable/DSL Router with Dynamic DNS support
- Home PC
- Internet Connection

**NOTE**

Router setup will differ slightly depending on router used. For this example, we will use the Asus WL500g because it has support for Dynamic DNS. Contact your router hardware vendor for setup help.

### Part I - Setup a DynDNS Account

1. Go to `http://www.dyndns.org` from your home PC.
2. Click on the ***Sign Up Now*** link.
3. Check the Check boxes, select a user name (i.e.: N7700), enter your email address (i.e.: xxx@example.com), check ***Enable Wildcard***, and create a password (i.e.: xxxx).
4. Wait for an email from www.dyndns.org.
5. Open the email and click on the link to activate your account

### Part II - Enable DDNS on the Router

1. Go to the router setup screen and select ***IP Config*** > ***Miscellaneous DDNS Setting*** from your Home PC.
2. Click on ***Yes*** for **Enable the DDNS Client?**
3. Select **`www.dyndns.org`**.
4. Go to router setup screen, and enter the following information:
    a. User Name or E-mail Address: **xxx@example.com**
    b. Password or DDNS Key: **xxxx**
    c. Host Name: **`www.N7700.dyndns.org`**
    d. Enable wildcard? Select ***Yes***
    e. Update Manually: Click ***Update***

### Part III - Setting up Virtual Servers (HTTPS)

1. Navigate to ***NAT Setting*** > ***Virtual Server***.
2. For **Enable Virtual Server?**, select ***Yes***
3. Setup the HTTPS Server
    a. **Well-Known Applications**: Select **User Defined**
    b. **Local IP**: Enter **`192.168.1.100`**
    c. **Port Range**: **`443`** (the default HTTPS port setting on the N7700)
    d. **Protocol**: select **TCP**
    e. Click ***Add***.
    f. Click ***Apply***.
4. Test the HTTPS connection from another computer on the Internet
    a. From a remote computer, open your browser and enter **`https://www.N7700.dyndns.org`**
    b. You should see the login page of N7700.

## *Firewall Software Configuration*

If you are using a software firewall (i.e. Norton Internet Security) and are having trouble connecting to the N7700, you can try the following steps:

1. Double click the **NIS** icon on system tray, and then configure the **Personal Firewall**.

2. On the **Programs** page, find the **SetupWizard.exe** and change its permission to "Permit All". If it's not in the program list, use the **Add** or **Program Scan** buttons to find it.

3. On the **Networking** page, manually add N7700 IP address (i.e. `192.168.1.100`) to the **Trusted** list.

## *Replacing Damaged Hard Drives*

If you are using RAID 1, RAID 5, RAID 6, or RAID 10, you can easily replace a damaged hard drive in the Thecus N7700 while keeping your data secure with the system's automatic data recovery.

### Hard Drive Damage

When a hard drive is damaged and data in the RAID volume, the system LCD will display warning message also the system beeps.

### Replacing a Hard Drive

To replace a hard disk drive in the N7700:

1. Remove the tray with the damaged hard disk.
2. Unscrew the damaged hard disk and remove it from the tray.
3. Slide a new hard disk into the tray and fasten the screws.
4. Insert the hard disk tray back into the N7700 until it snaps into place. You can also lock it with a key if desired.
5. The LED blinks green when the HDD is accessed.

### RAID Auto-Rebuild

When using RAID 1, 5, 6, or 10 on the N7700, you can use the auto-rebuild function when an error is detected.

1. When a hard disk fails the system beeps and/or an email notification is sent to specified receivers.
2. Check the LCD to see which disk has failed.
3. Follow the steps mentioned above to replace the failed hard disk.
4. The system automatically recognizes the new hard disk and starts the auto-rebuild sequence to resume its status before the hard disk crash.

# Chapter 8: Troubleshooting

## *Forgot My Network IP Address*

If you forget your network IP address and have no physical access to the system, you can find out the IP address by either looking directly onto the N7700's LCD panel, or by using the setup wizard to retrieve the IP of your N7700.

1. Start the Setup Wizard, and it will automatically detect all Thecus IP storage products on your network.

2. You should be able to find the IP address of the N7700 which you have forgotten in the **Device Discovery** screen.

## *Can't Map a Network Drive in Windows XP*

You may have problems mapping a network drive under the following conditions:

1. The network folder is currently mapped using a different user name and password. To connect using a different user name and password, first disconnect any existing mappings to this network share.

2. The mapped network drive could not be created because the following error has occurred: **Multiple connections to a server or shared resource by the same user, using more than one user name, are not allowed.** Disconnect all previous connections to the server or shared resource and try again.

To check out existing network connections, type net use under the DOS prompt. You may refer the URL below for more network mapping information.

http://esupport.thecus.com/support/index.php?_m=downloads&_a=viewdownload&downloaditemid=57&nav=0

## *Restoring Factory Defaults*

From the **System** menu, choose the ***Factory Default*** item and **the Reset to Factory Default** screen appears. Press ***Apply*** to reset the N7700 to factory default settings.

**WARNING** Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

## *Problems with Time and Date Settings*

The administrator is able to select an NTP Server to keep the N7700's time synchronized. However, if the N7700 can not access the Internet, you may encounter a problem when setting the Time and Time Zone. If this happens:

1. Login to the Web Administration Interface.

2. Navigate to ***System*** > ***Time***.

3. Under **NTP Server**, select ***No***.

4. Set the **Date**, **Time**, and **Time Zone**.

5. Click ***Apply***.

In addition, if the N7700 is able to access the Internet and you want to keep the NTP Server clock.isc.org by default, please make sure the DNS Server is correctly entered, thereby allowing the NTP Server name to correctly resolve. (See ***Network*** > ***WAN*** > ***DNS Server***)

# Appendix A: Product Specifications

## *Hardware Specifications*

| **Product Model** | **N7700** |
|---|---|
| Network Interfaces | |
| WAN | Gigabit RJ-45 connector |
| LAN | Gigabit RJ-45 connector |
| Storage | |
| HDD Bays | 7 x 3.5” SATA II HDD, hot-swappable |
| HDD Support | SATA II HDDs up to 2000GB |
| eSATA | 1 x eSATA connector for capacity expansion |
| I/O Interfaces | |
| USB Ports | 4 x USB type A ports (Host mode) |
| System Information | |
| LCD Control Panel | For basic configurations and status display |
| System LED Display | 6 x LED (Power, System status, Network Activity x 2, USB Copy, eSATA link) |
| Physical | |
| Height | 320 mm |
| Width | 210 mm |
| Depth | 270 mm |
| Power Supply | Server-rated AC power supply<br>100/220V AC, 50/60Hz, Auto-detect |
| Security | Lockable disk trays |
| Environment | |
| Temperature | 5 ~ 40°C |
| Humidity | 20 ~ 85% relative humidity (non-condensing) |
| Certifications | CE, FCC, BSMI, C-Tick, RoHS Compliant |

| **Product Model** | **N7700SAS** |
|---|---|
| Network Interfaces | |
| WAN | Gigabit RJ-45 connector |
| LAN | Gigabit RJ-45 connector |
| Storage | |
| HDD Bays | 7 x 3.5” SATA\SAS HDD, hot-swappable |
| HDD Support | SATA HDDs up to 2000GB, SAS HDD up to 1000GB |
| eSATA | 1 x eSATA connector for capacity expansion |
| I/O Interfaces | |
| USB Ports | 4 x USB type A ports (Host mode) |
| System Information | |
| LCD Control Panel | For basic configurations and status display |
| System LED Display | 6 x LED (Power, System status, Network Activity x 2, USB Copy, eSATA link) |
| Physical | |
| Height | 320 mm |
| Width | 210 mm |
| Depth | 270 mm |
| Power Supply | Server-rated AC power supply<br>100/220V AC, 50/60Hz, Auto-detect |
| Security | Lockable disk trays |
| Environment | |
| Temperature | 5 ~ 40°C |
| Humidity | 20 ~ 85% relative humidity (non-condensing) |
| Certifications | CE, FCC, BSMI, C-Tick, RoHS Compliant |

## *Software Specifications*

| | |
|---|---|
| Network File Protocols | Microsoft Networks (CIFS/SMB)<br>Apple Filing Protocol (AFP 3.0)<br>Network File System (NFS v3)<br>File Transfer Protocol (FTP)<br>Hyper Text Transfer Protocol (HTTP)<br>Secure Hyper Text Transfer Protocol (HTTPs) |
| Authentication | Local User Account<br>Microsoft Active Directory Authentication (AD)* |
| Network Client Type | Microsoft Windows NT/2000/XP/2003/Vista<br>Unix/Linux/BSD<br>MAC OS X/9 |
| Network Configuration | Fixed IP address<br>Dynamic IP address<br>802.3ad based failover and link aggregation |
| Disk Management | Disk status monitoring (S.M.A.R.T.)<br>Disk idle spin-down |
| RAID | RAID 0, 1, 5, 6, 10 and JBOD<br>Supports multiple RAID modes – users can create multiple RAID volumes with different RAID levels in one system<br>Auto rebuild<br>Hot swappable<br>Hot spare<br>Disk roaming<br>RAID level migration<br>RAID expansion |
| iSCSI Target | Supports:<br>Microsoft iSCSI Initiator v2.0.4<br>StarPort Initiator V3.5.2<br>MAC OS: globalSAN iSCSI initiator version 3.0 (1150)<br>Linux: open-iscsi 2.0-865 |
| Folder Management | Share folder level permission<br>Public folder |
| Quota Management | Share folder quota control |
| Backup | Thecus Backup Utility (Windows XP/2000 and MAC OS X)<br>Thecus Nsync |
| System Management | Web GUI<br>Multilingual support (English, French, German, Italian, Traditional Chinese, Simplified Chinese, Japanese, Korean, and Spanish)<br>NTP support<br>Wake-on-LAN<br>Scheduled Power On/Off |
| Event Notification | Email notification<br>Buzzer notification<br>LCD |
| UPS Support | UPS monitoring via RS-232 and system shutdown on low battery |
| Printer Server | USB Printer (IPP support) |
| Supported USB Devices | USB Printer |

| | |
|---|---|
| | External HDD/flash disk<br>USB IEEE 802.11 b/g dongle w/AP mode support** |
| Setup Utility | Windows 2000/XP/2003<br>MAC OS X |

*AD support: Works as a client member in a Microsoft Active Directory domain, allowing the N7700 to utilize the domain users and groups setting for authentication to the system and authorization to the share folders.

**For supported USB dongles, please contact sales@thecus.com

# Appendix B: Customer Support

If your N7700 is not working properly, we encourage you to check out **Chapter 8: Troubleshooting**, located in this manual. You can also try to ensure that you are using the latest firmware version for your N7700. Thecus is committed to providing free firmware upgrades to our customers. Our newest firmware is available on our Download Center:

http://www.thecus.com/download.php

If you are still experiencing problems with your N7700, or require a Return Merchandise Authorization (RMA), feel free to contact technical support via our Technical Support Website:

http://www.thecus.com/support_tech.php

Customers in the US should send all technical support enquiries to this email address:

support-us@thecus.com

For Sales Information you can e-mail us at:

sales@thecus.com

# Thank you for choosing Thecus!

# Appendix C: RAID Basics

## *Overview*

A Redundant Array of Independent Disks (RAID) is an array of several hard disks that provide data security and high performance. A RAID system accesses several hard disks simultaneously, which improves I/O performance over a single hard disk. Data security is enhanced by a RAID, since data loss due to a hard disk failure is minimized by regenerating redundant data from the other RAID hard disks.

## *Benefits*

RAID improves I/O performance, and increases data security through fault tolerance and redundant data storage.

### Improved Performance

RAID provides access to several hard disk drives simultaneously, which greatly increases I/O performance.

### Data Security

Hard disk drive failure unfortunately is a common occurrence. A RAID helps prevent against the loss of data due to hard disk failure. A RAID offers additional hard disk drives that can avert data loss from a hard disk drive failure. If a hard drive fails, the RAID volume can regenerate data from the data and parity stored on its other hard disk drives.

## *RAID Levels*

The Thecus N7700 supports standard RAID levels 0, 1, 5, 6, 10, and JBOD. You choose a RAID level when you create a system volume. The factors for selecting a RAID level are:

- Your requirements for performance
- Your need for data security
- Number of hard disk drives in the system, capacity of hard disk drives in the system

The following is a description of each RAID level:

### RAID 0

RAID 0 is best suited for applications that need high bandwidth but do not require a high level of data security. The RAID 0 level provides the best performance of all the RAID levels, but it does not provide data redundancy.

RAID 0 uses disk striping and breaking up data into blocks to write across all hard drives in the volume. The system can then use multiple hard drives for faster read and write. The stripe size parameter that was set when the RAID was created determines the size of each block. No parity calculations complicate the write operation.

### RAID 1

RAID 1 mirrors all data from one hard disk drive to a second one hard disk drive, thus providing complete data redundancy. However, the cost of data storage capacity is doubled.

This is excellent for complete data security.

### RAID 5

RAID 5 offers data security and it is best suited for networks that perform many small I/O transactions at the same time, as well as applications that require data security such as office automation and online customer service. Use it also for applications with high read requests but low write requests.

RAID 5 includes disk striping at the byte level and parity information is written to several hard disk drives. If a hard disk fails the system uses parity stored on each of the other hard disks to recreate all missing information.

### RAID 6

RAID 6 is essentially an extension of RAID level 5 which allows for additional fault tolerance by using a second independent distributed parity scheme (dual parity) Data is striped on a block level across a set of drives, just like in RAID 5, and a second set of parity is calculated and written across all the drives; RAID 6 provides for an extremely high data fault tolerance and can sustain two simultaneous drive failures.

This is a perfect solution for mission critical applications.

### RAID 10

RAID 10 is implemented as a striped array whose segments are RAID 1 arrays.
RAID 10 has the same fault tolerance as RAID level 1.
RAID 10 has the same overhead for fault-tolerance as mirroring alone. High I/O rates are achieved by striping RAID 1 segments.
Under certain circumstances, RAID 10 array can sustain up to 2 simultaneous drive failures

Excellent solution for applications that would have otherwise gone with RAID 1 but need an additional performance boost.

### JBOD

Although a concatenation of disks (also called JBOD, or "Just a Bunch of Disks") is not one of the numbered RAID levels, it is a popular method for combining multiple physical disk drives into a single virtual one. As the name implies, disks are merely concatenated together, end to beginning, so they appear to be a single large disk.

As the data on JBOD is not protected, one drive failure could result total data loss.

## *Stripe Size*

The length of the data segments being written across multiple hard disks. Data is written in stripes across the multiple hard disks of a RAID. Since multiple disks are accessed at the same time, disk striping enhances performance. The stripes can vary in size.

## *Disk Usage*

When all 7 disks are of the same size, and used in RAID, N7700 disk usage percentage is listed below:

| RAID Level | Percentage Used |
|---|---|
| RAID 0 | 100% |
| RAID 1 | 1/n x 100% |
| RAID 5 | (n-1)/n x 100% |
| RAID 6 | (n-2)/n x 100% |
| RAID 10 | 50% |
| JBOD | 100% |

n：HDD number

# Appendix D: Active Directory Basics

## *Overview*

With Windows 2000, Microsoft introduced Active Directory (ADS), which is a large database/information store. Prior to Active Directory the Windows OS could not store additional information in its domain database. Active Directory also solved the problem of locating resources; which previously relied on Network Neighborhood, and was slow. Managing users and groups were among other issues Active Directory solved.

## *What is Active Directory?*

Active Directory was built as a scalable, extensible directory service that was designed to meet corporate needs. A repository for storing user information, accounts, passwords, printers, computers, network information and other data, Microsoft calls Active Directory a "namespace" where names can be resolved.

## *ADS Benefits*

ADS lets the N7700 integrate itself with the existing ADS in an office environment. This means the N7700 is able to recognize your office users and passwords on the ADS server. Other major benefits ADS support provides include:

1. Easy integration of the N7700 into the existing office IT infrastructure

   The N7700 acts as a member of the ADS. This feature significantly lowers the overhead of the system administrator. For example, corporate security policies and user privileges on an ADS server can be enforced automatically on the N7700.

2. Centralized user/password database

   The N7700 does not maintain its own copy of the user/password database. This avoids data inconsistency between the N7700 and other servers. For example, without ADS support, an administrator might need to remove a specific user privilege on the N7700 and each individual server. With ADS support, the change on an ADS server is known to all of its ADS members.

# Appendix E: UPS Compatibility List

| Brand | Series | Model | Notes |
|---|---|---|---|
| Ablerex | MS-RT | | |
| ActivePower | 1400VA | | |
| AEC | MiniGuard UPS 700 M2501 cable | | |
| APC | Back-UPS Pro | | |
| | Matrix-UPS | | |
| | Smart-UPS | | |
| | Back-UPS | 940-0095A/C cables, 940-0020B/C cables, 940-0023A cable | |
| | Back-UPS Office | 940-0119A cable | |
| | Masterswitch Not a UPS - 940-0020 cable | | |
| | Back-UPS RS 500 custom non-USB cable | | |
| Belkin | Regulator Pro serial | | |
| | Resource | | |
| | Home Office | F6H350-SER, F6H500-SER, F6H650-SER | |
| | Universal UPS | F6C800-UNV, F6C120-UNV, F6C1100-UNV, F6H500ukUNV | |
| Best Power | Fortress (newer) | | |
| | Fortress Telecom | | |
| | Axxium Rackmount | | |
| | Patriot Pro | | |
| | Patriot Pro II | | |
| | Patriot INT51 cable | | |
| | Micro-Ferrups | | |
| | Fortress/Ferrups f-command support | | |
| Centralion | Blazer | | |
| Clary | ST-800 | | |
| Compaq | T1500h | | |
| Cyber Power Systems | | 320AVR, 500AVR, 650AVR, 700AVR, 800AVR 850AVR, 900AVR, 1250AVR,. 1500AVR, Power99 550SL, 725SL, CPS825VA, 1100AVR, 1500AVR-HO | |
| Deltec | PowerRite Pro II | | |
| Dynex | 975AVR | | |
| Effekta | MI/MT/MH 2502 cable | | |
| Energy Sistem | (various) | | |
| ETA | mini+UPS WinNT/Upsoft cable | | |
| ETA | mini+UPS PRO UPS Explorer cable | | |
| Ever UPS | NET *-DPC | | |
| | AP *-PRO | | |
| Ever-Power | 625/1000 | | |
| Exide | NetUPS SE | | |
| Fenton Technologies | PowerPal P-series | | |
| | PowerPal L-series | | |
| | PowerOn | | |
| | PowerPure | | |
| Fairstone | | L525/L625/L750 | |
| Fideltronik | Ares 700 and larger | | |
| | Other Ares models | | |

| Brand | Series | Model | Notes |
|---|---|---|---|
| Fiskars | PowerRite MAX | | |
| | PowerServer | 10, 30 | |
| Gamatronic | All models with alarm interface | | |
| | MP110/210 | | |
| | MS-T | | |
| | MS | | |
| | µPS3/1 | | |
| Gemini | UPS625/UPS1000 | | |
| HP | R3000 XR | | |
| | R5500 XR | | |
| INELT | Monolith 1000LT | | |
| Infosec | iPEL | 350, 500, 750, 1000 | |
| Ippon | (various) | | |
| Liebert | UPStation GXT2 contact-closure cable | | |
| Masterguard | (various) | | |
| Meta System | HF Line | 1..4 boards, /2 5..8 boards | |
| | HF Millennium | 810, 820 | |
| | HF TOP Line | 910, 920, 930, 940, 950, 960, 970, 980 | |
| | ECO Network | 750, M1000, M1050, M1500, M1800<br>M2000, M2100, M2500, M3000 | |
| | ECO | 305, 308, 311, 511, 516, 519, 522 | |
| | ally HF | 800, 1000, 1250, 1600, 2000, 2500 | |
| | Megaline | 1250, 2500, 3750, 5000, 6250, 7500, 8750, 10000 | |
| MGE UPS SYSTEMS | NOVA AVR 600 Serial | | |
| | NOVA AVR 1100 Serial | | |
| | Pulsar Ellipse | USBS Serial cable, S, Premium USBS Serial cable, Premium S | |
| | Ellipse Office | 600 Serial cable, 750 Serial cable, 1000 Serial cable, 1500 Serial cable | |
| | Pulsar EXtreme C / EX RT | | |
| | Comet EX RT | Serial port, 3:1 Serial port | |
| | Pulsar Esprit | | |
| | Evolution S | 1250, 1750, 2500, 3000 | Serial Port |
| | Pulsar M | 2200, 3000, 3000 XL | Serial Port |
| | Pulsar | 700, 1000, 1500, 1000 RT2U, 1500 RT2U, MX 4000 RT, MX 5000 RT<br>Evolution, EXtreme C, ES+, ESV+, SV, ESV, EX, EXL, PSX, SX, Extreme | Serial Port |
| | Comet EXtreme | | |
| | Comet / Galaxy (Serial) | Utalk Serial Card (ref 66060), HID COM Serial Card (ref 66066) | |
| MicroDowell | B.Box BP | 500, 750, 1000, 1500 | |
| Microsol | Solis | 1.0 1000VA, 1.5 1500VA, 2.0 2000VA, 3.0 3000VA | |
| | Rhino | 6.0 6000VA, 7.5 7500VA, 10.0 10000VA, 20.0 20000VA | |
| Mustek | Various | | |
| | Powermust | 400VA Plus, 600VA Plus, 800VA Pro<br>1000VA Plus, 1400VA Plus, 2000VA USB | |
| Nitram | Elite | 500, 2002 | |
| Oneac | EG/ON Series advanced interface | | |
| Online | P-Series | | |
| OnLite | AQUA 50 | | |
| Orvaldi | various not 400 or 600 | | |
| Powercom | SMK-800A | | |
| | ULT-1000 | | |

| Brand | Series | Model | Notes |
|---|---|---|---|
| Powercom | TrustTrust 425/625 | | |
| | BNT-1000AP | | |
| | Advice Partner/King Pr750 | | |
| | BNT-2000AP | | |
| PowerGuard | PG-600 | | |
| PowerKinetics | 9001 | | |
| PowerTech | Comp1000 DTR cable power | | |
| Power Walker | Line-Interactive VI1000 | | |
| Powerware | | 3110, 3115, 5119, 5125, 5119 RM, PW5115 PW5125PW9120, PW9125, 9120, 9150, 9305 | |
| Powerwell | PM525A/-625A/-800A/-1000A/-1250A | | |
| Repotec | RPF525/625/800/1000 | | |
| | RPT-800A | | |
| | RPT-162A | | |
| SMS (Brazil) | Manager III | | |
| SOLA | | 325, 520, 610, 620, 330 | |
| SOLA/BASIC Mexico | various ISBMEX protocol | | |
| Socomec Sicon | Egys 420 VA | | |
| Soltec | Winmate 525/625/800/1000 | | |
| Soyntec | Sekury C | 500, 800 | |
| SquareOne Power | QP1000 | | |
| SuperPower | HP360, Hope-550 | | |
| Sweex | 500/1000 smart - shipped with SafeNet | | |
| | 500/1000 contact closure - shipped with UPSmart | | |
| | BC100060 800VA | | |
| Sysgration | UPGUARDS Pro650 | | |
| Tecnoware | Easy Power 1200 | | |
| Tripp-Lite | SmartUPS | | |
| | SmartOnline | | |
| | (various) Lan 2.2 interface - black 73-0844 cable | | |
| Trust | UPS 1000 Management PW-4105 | | |
| UNITEK | Alpha | 500 IC, 1000is, 500 ipE | |
| UPSonic | LAN Saver 600 | | |
| | Power Guardian | | |
| Victron/IMV | (various) | | |
| | Lite crack cable | | |

**NOTE**

- The UPSes marked Blue have been tested and work well
- If your UPS is not in the support list, be sure that the UPS supports one of following protocols:
  - SEC protocol
  - Generic RUPS model
  - Generic RUPS 2000 (Megatec M2501 cable)
  - PhoenixTec protocol
  - Safenet software

# Appendix F: Licensing Information

## *Overview*

This product included copyrighted third-party software licensed under the terms of GNU General Public License. Please see THE GNU General Public License for extra terms and conditions of this license.

## *Source Code Availability*

Thecus Technology Corp. has exposed the full source code of the GPL licensed software. For more information on how you can obtain our source code, please visit our web site, http://www.thecus.com.

### Copyrights

- This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
- This product includes software developed by Mark Murray.
- This product includes software developed by Eric Young (eay@cryptsoft.com).
- This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).
- This product includes PHP, freely available from (http://www.php.net/).
- This product includes software developed by the University of California, Berkeley and its contributors.
- This product includes software developed by Winning Strategies, Inc.
- This product includes software developed by the Apache Group for use in the Apache HTTP server project (http://www.apache.org/).
- This product includes software developed by Softweyr LLC, the University of California, Berkeley, and its contributors.
- This product includes software developed by Bodo Moeller.
- This product includes software developed by Greg Roelofs and contributors for the book, "PNG: The Definitive Guide," published by O'Reilly and Associates.
- This product includes software developed by the NetBSD Foundation, Inc. and its contributors.
- This product includes software developed by Yen Yen Lim and North Dakota State University.
- This product includes software developed by the Computer Systems Engineering Group at Lawrence Berkeley Laboratory.
- This product includes software developed by the Kungliga Tekniska Högskolan and its contributors.
- This product includes software developed by the Nick Simicich.
- This product includes software written by Tim Hudson (tjh@cryptsoft.com).
- This product includes software developed by Christopher G. Demetriou for the NetBSD Project.

## *CGIC License Terms*

Basic License

CGIC, copyright 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004 by Thomas Boutell and Boutell.Com, Inc.

Permission is granted to use CGIC in any application, commercial or noncommercial, at no cost. HOWEVER, this copyright paragraph must appear on a "credits" page accessible in the public online and offline documentation of the program. Modified versions of the CGIC library should not be distributed without the attachment of a clear statement regarding the author of the modifications, and this notice may in no case be removed. Modifications may also be submitted to the author for inclusion in the main CGIC distribution.

## *GNU General Public License*

Version 2, June 1991

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PREAMBLE

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